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# HEALTH STATISTICS

FROM THE U.S. NATIONAL HEALTH SURVEY

## Comparison of Hospitalization Reporting in three survey procedures

A study of alternative survey methods for collection of  
hospitalization data from household respondents.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

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The U. S. National Health Survey is a continuing program under which the Public Health Service makes studies to determine the extent of illness and disability in the population of the United States and to gather related information. It is authorized by Public Law 652, 84th Congress.

### CO-OPERATION OF THE SURVEY RESEARCH CENTER, THE UNIVERSITY OF MICHIGAN AND THE BUREAU OF THE CENSUS

Under legislation establishing the National Health Survey, the Public Health Service is authorized to use, insofar as possible, the services or facilities of other Federal, State, or private agencies. The methodological study in this report was performed under a contractual arrangement with the Survey Research Center, Institute for Social Research, The University of Michigan. The Bureau of the Census also participated actively in the planning and conduct of the research.

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## PREFACE

This report is the second in the U. S. National Health Survey's methodological series on the subject of hospitalization reporting in the Health Interview Survey, both of which were conducted by the Survey Research Center of The University of Michigan under contract with the U. S. National Health Survey and in co-operation with the Bureau of the Census. These studies are part of a program of the National Health Survey to evaluate the reliability of its statistics and to develop and test improved methods for collection of data. (Prior publications in this developmental and evaluation series are listed inside the back cover of this report.) The statistical design and procedures used in the Health Interview Survey of the U. S. National Health Survey are described in two National Health Survey publications.<sup>1 2</sup>

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<sup>1</sup>U. S. National Health Survey, *The Statistical Design of the Health Household-Interview Survey* Health Statistics Series A-2. PHS Publication No. 584-A2 Public Health Service, Washington, D. C., July 1958.

<sup>2</sup>U. S. National Health Survey, *Concepts and Definitions in the Health Household-Interview Survey* Health Statistics Series A-3. PHS Publication No. 584-A3 Public Health Service, Washington, D. C., September 1958.

The study was a co-operative project of the staffs of the Bureau of the Census, the Survey Research Center, and the National Health Survey, each organization actively participating in all phases of the study. The sample was designed by Harold Nisselson of the Bureau of the Census. Katherine Capt and George Kearns of the Bureau of the Census were responsible for the preparation of interviewing manuals, training of interviewers, and general quality control of the field operations. An important contribution was also made by John Tharaldson, Edward Knowles, and John Campbell of the Detroit Regional Office of the Bureau of the Census, who helped in selecting the sample from the hospitals and carrying out the field procedures.

Charles F. Cannell, Ph.D., and Floyd Fowler were the principal investigators for the Survey Research Center. In addition to developing a special experimental procedure and questionnaire for the collection of hospitalization data, they were also responsible for the report presented here.

Earl Bryant of the U. S. National Health Survey staff had the responsibility of co-ordinating the activities of the participating organizations and conveying the National Health Survey viewpoint in decisions on methodology. He also edited the contractor's report for the present publication.



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#### SYMBOLS AND NOTES

Magnitude of the sampling error precludes  
showing separate estimates----- (\*)

NOTE: Due to rounding detailed figures  
within tables may not add to totals

# COMPARISON OF HOSPITALIZATION REPORTING

## in three survey procedures

The following research report was prepared by the Survey Research Center, Institute for Social Research, The University of Michigan, under contract with the National Health Survey Division, National Center for Health Statistics. Charles F. Cannell, Ph.D. and Floyd Fowler, of the Institute for Social Research, directed the project and were responsible for the analysis and the report presented here; Leslie Kish, Ph.D., provided guidance on statistical problems and was responsible for the variance analysis. Valuable assistance was also given by Thomas Bakker during the pilot investigations and by Mrs. Doris Muehl who supervised the editing and coding procedures.

### SUMMARY

The objective of this research was to compare the effectiveness of two experimental procedures with the standard Health Interview Survey of the U. S. National Health Survey procedure in obtaining information about hospital stays. Procedure A, the control, used the standard Health Interview Survey (HIS) questionnaire and procedures. Procedure B was a revised interview schedule which was followed by a mail form in which any information about hospital stays that had been overlooked in the interview was to be recorded by the respondent. Procedure C eliminated the questions about hospitalizations from the interview; the requested information was to be entered on a self-administered form which was given to the respondent by the interviewer at the close of the interview. The follow-up forms in Procedures B and C were to be mailed to the Regional Office of the Bureau of the Census.

The design of the study and interpretation of results must be judged in the context of primary purposes of the undertaking. Previous research had suggested a considerable variety of steps and techniques which might constitute improvements. The prime effort was to construct a total procedure which included a number of these potential improvements, and to test this procedure against the current standard. The key decision would be whether the new procedure was better than the

old, with only secondary consideration being given to which of several factors were chiefly responsible for any net improvement that should appear. This new or consolidated procedure was the one designated Procedure B. During the course of planning the study, the possibility arose that a more streamlined self-administered approach might yield most of the benefits hoped for from the consolidated procedure. Accordingly, Procedure C was included in the test.

Thus the analysis puts primary emphasis on over-all net effectiveness of the three procedures. It does not include comparative costs of the different processes. Further, it is important to note that the total effect from Procedure B is the product of a rather intensive interview routine followed by a self-administered process; while the effect from Procedure C is the consequence of a self-administered process followed by a telephone and personal visit interview for a substantial number of nonrespondents. Care must therefore be taken in ascribing the cause for different results to any single feature of the procedures.

For several reasons the study does not produce a representative measure of underreporting, and Procedure A does not produce a valid estimate of the level of the underreporting errors for estimates shown in publications of the Health Interview Survey of the National Health Survey. Prominent among their reasons are (1) restriction of the study to Detroit; (2) elimination of hos-



pital episodes for deliveries, which previous studies have shown to be very well reported; and (3) the fact that NHS publications currently are based on a six-month-recall period. The net effect of these differences is an implied overstatement of underreporting by several percentage points for NHS published data.

A stratified sample was selected from Detroit hospitals of residents of the Detroit area who had had one or more hospital stays during the year preceding the interviewing. Those whose only hospital stays were for normal deliveries were excluded from the sample.

The following are some of the significant findings of this study:

The proportions of the known sample of hospital episodes which were not reported were 17 percent for Procedure A, 9 percent for procedure B, and 16 percent for Procedure C. The difference in the reporting in experimental Procedure B and the control Procedure A is significant at the 0.05 level of confidence.

When apparent overreports were included, the rate of underreporting was decreased by two or three percentage points for each procedure.

There was an increase in the underreporting rate for all three procedures as the length of time between the hospital discharge and the interview increased. There was an especially sharp increase in underreporting for all procedures when the discharge preceded the interview by more than 40 weeks. However, the relationship was somewhat weaker in Procedure B for episodes which occurred within 40 weeks of the interview.

One-day stays were reported very poorly, with the underreporting rates being almost the same for all three procedures. For all other stays, however, the reporting in Procedure B showed marked improvement.

For all three procedures the degree of social threat or embarrassment of the diagnosis leading to hospitalization was negatively related to the rate of reporting.

Episodes which involved surgical treatment were reported significantly better in all three procedures than those which did not.

There was a consistent relationship in all three procedures between the number of chronic and acute conditions reported for the sample person and the reporting rate; the rate improved with an increase in the number of conditions.

In all three procedures, the reporting for persons with three or more episodes in the sample was considerably poorer than for persons with only one or two.

For all procedures, the underreporting rate was higher for nonwhite than for white persons.

In Procedures B and C the reporting for persons in low income families was significantly poorer than it was for those in higher income families. The same pattern was found in Procedure A.

In Procedure A, episodes for persons with higher education were reported somewhat better than those for persons with lower education. This bias is even more apparent in Procedure C, but is essentially eliminated by Procedure B.

Respondents reported their own episodes considerably better than they reported the episodes of others in Procedure A. This tendency is reduced in Procedure C and eliminated in Procedure B.

A large proportion (30 percent) of the hospital episodes not reported in the direct interview for Procedure B was obtained in a mail-follow-up procedure.

It was found that the promptness with which respondents replied to the follow-up was directly related to the quality of reporting in both Procedures B and C.

Month of discharge was reported equally well in all three procedures.

Procedure C proved to be significantly better than Procedure A in obtaining correct reports of the number of days involved in hospital episodes.

The most outstanding finding, of course, was the significant improvement of reporting found in Procedure B. In this improvement, one clear factor was the better reporting for proxy-respondents; another was the reduction of underreporting for persons in the lower educational brackets.

While it is not possible to specify the reasons for these improvements, several aspects of the procedure were designed to "motivate" respondents. As the study yielded considerable evidence that the level of motivation of the respondent is an important determinant of how well he reports, it is suggested that the success of Procedure B may be largely attributable to its effectiveness in encouraging and directing increased effort to report.

## OBJECTIVES OF THE STUDY AND DESCRIPTION OF THE RESEARCH DESIGN

### Introduction

In 1959 the Survey Research Center, under contract with the National Health Survey, and working co-operatively with the National Health

Survey and the Bureau of the Census, conducted a study which compared hospitalizations reported in household interviews with those recorded in hospitals.<sup>3</sup> The purpose of the study was to estimate the magnitude of underreporting of hospital episodes in the Health Interview Survey of the National Health Survey, to investigate some of the patterns of underreporting, and to develop hypotheses relating to the mechanisms of underreporting. For ease of reference the 1959 study is referred to in this report as Special Study No. 8, which was used as the working title.

Based largely upon the findings of Special Study No. 8, another study was carried out, designed to test new methods of collecting hospitalization data from household respondents. This report presents the analysis of the experimental study.

Since Special Study No. 8 provided the basis for the development of new experimental techniques for improving the reporting of hospital data in the Health Interview Survey, a brief summary of the hypotheses developed from the results of Special Study No. 8 is given for background information. In addition, proposed changes which were the basis for the development of experimental procedures are described.

In Special Study No. 8, respondents were asked to report hospitalizations which occurred during the 12 months preceding the Sunday night of the week in which the interview was conducted. Such a time period is confusing to the respondent and apparently creates problems of time reference.

The marked underreporting of episodes occurring near the beginning of the 12-month period suggested that when the respondent was in doubt he preferred to recall the episode as having taken place before the beginning of the year and, thus, did not report it.

The proposed solution to this problem was to use as a reference period that part of the calendar year preceding the interview and the preceding calendar year. The analysis then could be based on the 12 calendar months preceding the month in which the interviewing took place.

There is a lack of positive motivation on the part of respondents to devote the amount of energy required to report hospital episodes. To recall

hospitalizations over a period of one year requires the respondent to exert some effort. Many respondents are not so motivated and are inclined to complete the interview as rapidly and as easily as possible, reporting only those events which are most salient at the moment.

Proposed solutions were to:

- a. Ask more probe questions to stimulate the respondent to work harder.
- b. Ask questions about hospitalizations which research showed to be most commonly unreported—minor episodes and those which occurred several months prior to the interview.
- c. Ask about each individual separately instead of about the entire family.
- d. Send a brochure to the household prior to the interview to stress the importance of the survey.
- e. Use the respondent as an interviewer to collect information from other members of the family through a self-administered form.

There is a tendency for people to conceal or distort their memory of episodes which are embarrassing or physically threatening. This may be because respondents have reservations about reporting certain types of problems or because the emotional nature of the episode has resulted in distortion or suppression of the memory of the experience.

The assumption is that most episodes are not so threatening or stressful that they cannot be obtained by an interviewer, but that a greater motivational force is required to obtain the information. A follow-up interview which was part of Special Study No. 8 supports this conclusion.

Proposed solutions to this problem were to:

- a. Use a self-administered form where it might be easier for the respondent to report episodes which would not be reported readily to an interviewer.
- b. Include introductory statements in the questions to stress the importance of the data.
- c. Use the brochure mentioned above.

The viewpoint taken in this research is that problems of memory can be understood and dealt with more successfully if they are considered in terms of motivation. For instance, a hospitalization of one day's duration which occurred nearly a year ago is not actually an inaccessible memory, but greater effort and, therefore, a higher level of motivation is required for the respondent to report it. In the same way, an operation which is surrounded with intense emotion is not actually

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<sup>3</sup>U. S. National Health Survey. *Reporting of Hospitalization in the Health Interview Survey*, Health Statistics, Series D-4. Public Health Service Publication No. 584-D4. Public Health Service, Washington, D. C., May 1961.

repressed, but it requires a higher level of motivation for the respondent to be willing to discuss it. This concept is not derived solely from theory but conforms closely to the data from Special Study No. 8, especially those from the follow-up interviews.

### The Pilot Investigations

Because of time and budgetary limitations, it was not possible to set up an elaborate experimental design to test all the variables separately. Instead, several small pilot investigations were conducted, each built upon the preceding one, and each one testing one or more new concepts. For the most part, the evaluation of these investigations was subjective, although tabulations were made of the major variables. The number of cases in each pilot study was small so that no statistical tests were attempted. Each pilot study consisted of between 25 and 50 interviews; a total of six investigations were carried out.

Five interviewers were employed in the pilot studies, each of whom had considerable experience in pretesting questionnaires and new field ideas.

The sample for the pilot investigations was selected from persons discharged from two Detroit hospitals. It was selected by a random process and covered hospital discharges during the preceding 18 months.

The interviewers were told that someone in each family assigned to them had been hospitalized within the past two years. This was necessary, because it was important to use the interviewers' experience to evaluate the various procedures.

A questionnaire was prepared for each pilot investigation. Interviewers were asked to record verbatim the responses given to each question, and to note anything that might be relevant to the problem of reporting hospital stays. In addition, interviewers were asked to explore, on their own initiative, new questions which they thought might be useful in eliciting unreported hospital episodes. Such exploration was undertaken only after the specified sequence of questions was asked.

After each pilot investigation, a meeting was held with all interviewers. Interviewers' ideas as to how to improve the questionnaire were discussed, and each interviewer's experience with each question was reviewed in detail.

Following the discussions the interviews were analyzed, searching for ways to improve the re-

porting of hospitalizations. The following is a summary of findings of the pilot investigations.

The frame of reference of the respondent in reporting hospitalizations.—In the first pilot study two frames of reference were observed. If left free to report hospitalizations for themselves and their families, some respondents first talked about the more serious episodes for all family members and then the minor episodes for all family members. Other respondents tended to report systematically for each member of the family in turn, regardless of whether the episodes were major or minor. In later pilot studies the problem was to discover which frame of reference seemed to predominate and to make use of it in the questionnaire design, the assumption being that the closer the questioning conforms to the respondent's way of attacking the problem, the better the reporting.

In subsequent pilot investigations, both approaches were used independently.

The conclusion reached was that for small families or families with a small number of episodes, the first method was satisfactory. For large families, particularly where several members had been hospitalized, a systematic questioning about each family member produced more complete reports. The second approach was used in the final questionnaire.

Use of additional questions.—Interviewers tried various additional questions or probes to obtain more complete reporting of episodes. In the first test, interviewers were asked to use whatever follow-up questions seemed most appropriate to obtain more complete reporting. Additional episodes were obtained by the use of these questions and several were standardized for the successive pilot investigations. Three types of follow-up questions were tried. The first, general probes, of the type, "Did you have any other hospital stays?" The second, questions about possible types of hospitalization; for operations, for observations, to have a baby, etc. The third type focused on minor episodes and those occurring several months prior to the interview.

Most families have only one or two episodes to report. Thus respondents tended to become irritated at being asked a series of questions, since they felt they had reported all of their episodes in response to the original question. Rapport tended to suffer, and respondents developed a fixed response—they answered "no" without really considering the question. A lengthy series of probes, therefore, defeated its own purpose, and it was concluded that only a few probes

should be used. Since the major problem of underreporting was for minor episodes, and those removed in time from the interview, it was decided to focus the probes on these issues.

It was found that telling the respondent the reason for asking the questions helped to counteract negative reactions. The probes, therefore, were introduced with the statement "We find that people tend to forget . . . etc." With these changes the respondents appeared to tolerate the additional probes, and these changes resulted in picking up episodes previously unreported.

The reference period for reporting.—For reasons described in the review of hypotheses in the previous section, respondents were asked about episodes occurring at any time during the calendar year 1959 and that part of 1960 prior to the interview. (The pilot study interviewing was done in the fall of 1960, so respondents were reporting for 22 or 23 months.) The analysis period was the 12 calendar months preceding the month of the interview.

Accuracy of reporting admission and discharge dates.—Various methods of obtaining dates of admission and discharge were tried in successive pilot studies. The objective was to find the most accurate method of obtaining the discharge date, which was basic to the analysis.

The discharge date can be obtained either by asking for the month of discharge in the interview or by calculating the month of discharge by use of the admission date and the length of hospitalization. In the first pilot studies respondents were asked the month and day of admission, the length of stay, and the month and day of discharge. A comparison of these reports with hospital records revealed that respondents were fairly accurate on the month of admission or discharge, but inaccurate as to the day of admission. The report of the month of admission was slightly more accurate than the month of discharge. Of the two methods, it was found that the reported discharge month was considerably more accurate than the computed discharge date using the date of admission and the length of stay. It was found also that handing the respondent a calendar before asking about dates improved reporting accuracy.

Procedures to motivate the respondent.—Special Study No. 8 plus many other related studies provide evidence that special attempts needed to be taken to motivate the respondent to report accurately. Several techniques were attempted in the pilot studies.

Introductions to the National Health Survey, which were designed to stress the importance of accurate data for health planning and to educate

the respondent in some of the uses made of the information, were used by interviewers. These statements were later incorporated into a brochure and mailed to each household prior to the interview.

In addition to the general introduction, special phrases were used to preface the hospital questions. The objective of these questions was to provide the respondent with some added stimulation to report episodes.

Special problems.—During the pilot studies, some of the questions were reworded. Two changes are sufficiently interesting to be reported here. The word "hospitalization" was confusing to some respondents. Some failed to understand the word, and for others the implication was of a "serious or long stay in the hospital." Hence the final questionnaire used the awkward but meaningful phrase "hospital stay." The word "patient" also gave trouble, again because respondents tended to associate the word with severe illness. The word was therefore dropped.

As a result of these pilot studies, techniques gradually evolved which appeared to increase the probability of obtaining a higher proportion of reports of hospitalizations than did the standard National Health Survey household interview. These techniques were then used in this experimental study. The design of this study is described below.

## The Sample Design

Since the major interest in this study was in a comparison of procedures for collecting hospitalization data, rather than in population estimates as such, it was decided to conduct the study in a single, compact area. The efficiencies which resulted saved considerable money.

A sample of 20 general or short-stay hospitals was chosen from those listed for the Detroit urbanized area by the American Hospital Association and the American Osteopathic Hospital Association. The hospitals were selected with probability proportional to the number of discharges they had during 1960 (exclusive of discharges for deliveries and for deaths). Sixteen of the twenty hospitals agreed to participate in the study. Replacements were selected for three of the four. Two of these replacements agreed to co-operate, making a total of 18 sample hospitals.

The second-stage-sample selection was of persons discharged from the hospitals between May 1, 1960 and March 31, 1961. The sampling fraction for each hospital was such that the product of the first-stage-sampling ratio (of selecting

hospitals) and the second-stage ratio was constant. The sample persons were selected systematically after a random start from a list of discharges routinely maintained by the hospitals.

To maintain the desired constant sampling fraction for each sample person, a subsample of persons with multiple discharges was taken, proportional to the number of discharges they had during the sampling time interval. Restrictions were put on the sample design to exclude the following:

Persons who lived outside the Detroit urbanized area.

Persons whose only episode during the year was for a normal delivery. This restriction was placed since it was found in Special Study No. 8 that 97 percent of the deliveries were reported, and it was desired to weight the sample toward the less readily reported episodes.

Hospital episodes with stay of less than overnight. This conforms with the specifications of the National Health Survey.

Persons who died in the hospital.

Persons who were found to have moved outside the Detroit urbanized area. If the sample person no longer lived at the address given on the hospital record and could not be located, it was assumed that he had moved out of the area.

After the person was chosen for the sample, abstracts of all his episodes terminating between May 1, 1960 and the date of interview were obtained. (The interviews were conducted during the five-week period beginning May 1, 1961.) Since the sample was of persons discharged during the period, May 1960-March 1961, abstracts showing discharge dates during April, May, and June were for persons readmitted to the hospital and discharged during this period. Special Study No. 8 showed that discharges which had occurred near the date of interview were reported more accurately than those which had occurred earlier. Thus, by design, the sample consisted of relatively few discharges near the date of interview.

A Latin Square design was used consisting of four orthogonal, completely randomized Latin Squares which generated the interviewing assignments. These assignments consisted of approximately 18 interviews per week per interviewer.\*

\*The design was worked out by Harold Nisselson of the Bureau of Census.

The design used as two major sources of variance the week of the interview and the region of the city. These were randomized, with the effects of their interactions assumed to be balanced or negligible.

The city was divided into five geographic regions, and as has been mentioned the interviewing was conducted in five weeks. Twenty interviewers were divided randomly into two groups. One group used the control procedure (Procedure A) and one experimental procedure (Procedure C), while the other group used the two experimental procedures (Procedures B and C). (These procedures are described in the following section.) This division in assignments was necessary because of the particular procedures to be tested. Thus, the Procedure C interviews were taken by 20 interviewers; Procedures A and B interviews were taken by different groups of 10 interviewers. Each interviewer was assigned twice as many A or B interviews as C interviews. The following table, one of the four Latin Squares, will illustrate the design.

	Region I	Region II	Region III	Region IV	Region V
A,C interviewer #1	Week 5	Week 2	Week 4	Week 1	Week 3
A,C interviewer #2	Week 2	Week 1	Week 3	Week 4	Week 5
A,C interviewer #3	Week 1	Week 3	Week 5	Week 2	Week 4
A,C interviewer #4	Week 4	Week 5	Week 2	Week 3	Week 1
A,C interviewer #5	Week 3	Week 4	Week 1	Week 5	Week 2

It may be seen that there were five possible patterns of interviewing assignments. Taking interviewer No. 1, for Week 5 all of her interviews fell into Region I of the city. Two thirds of these interviews were Procedure A and one third, Procedure C. Since there were 20 interviewers, three other interviewers were working in the same region during Week 5, one other A,C interviewer and two other B,C interviewers.

The patterns were such that no interviewer worked in any region for more than one week; and no two interviewers worked together in the same region more than once.

Region of the city was selected as a major source of variance for three reasons. First, since a given hospital tends to serve persons in

its immediate area, control on region, to some extent, controlled the variance between hospitals. Second, there was some evidence in Special Study No. 8 that socioeconomic status is related to the rate with which hospitalizations are reported. Controlling the region of the city, to some extent, made it possible to isolate the variance attributable to this relationship. In addition, restricting the sample to five regions seemed to give optimum spread without substantially increasing travel costs per interview.

### Description of the Procedures

As was described in the section on the research design, three procedures were used in this study; one control procedure and two experimental procedures. The questionnaires and forms used can be found in Appendix II.

Procedure A—the control interview.—The survey procedure referred to as "Procedure A" in this report was essentially the standard procedure used in 1961 by the Health Interview Survey of the National Health Survey, except that some minor changes were made in anticipation of the 1962 NHS questionnaire.

Prior to the interview, a letter was sent to each Procedure A household informing the family that a Bureau of Census interviewer would visit their home in a week or two. This letter and questionnaires used in the study are shown in Appendix II.

In the interview the hospital questions were asked about each family member separately, rather than about the family group as a whole as has been the procedure used in the National Health Survey in the past.

Procedure B—an experimental interview and follow-up self-administered questionnaire.—Procedure B consisted of a direct interview and a mail follow-up questionnaire. The direct interview questionnaire was developed as a result of the pilot investigations described earlier. The questions are identical to those used in Procedure A except for marked differences in the hospitalization section. These differences are as follows:

Hospital questions were expanded to include additional probe questions.

The reference period was 1960 and that part of 1961 prior to the interview rather than the 12 months prior to the week of interview as used in Procedure A.

Respondents were asked to report month and year of discharge rather than month and year of admission.

Special explanatory statements were included in the section.

This procedure was also different from Procedure A in that a special brochure was enclosed with the letter which is ordinarily sent to the households prior to the interviews. The brochure is reproduced in Appendix II.

Following the interview the questionnaires were edited in the Census Regional Office. As soon as the editing was completed, a self-administered form was mailed to the family. This form contained the family composition as reported to the interviewer and a record of the hospitalizations as reported in the interview. Respondents were asked to answer a few questions designed to elicit additional hospitalizations and return it to the Bureau of the Census office. If the form was not received within one week after the date of the first mailing, a follow-up form was mailed, containing the same questions but a different letter from the Census Regional supervisor. If neither form was returned, an attempt was made to obtain the information by telephone. If telephoning was not possible, a personal visit was made and the data collected by interview.

Procedure C—the experimental self-administered questionnaire.—In this procedure the interview questionnaire was identical to that used in Procedure A except that no questions on hospitalizations were included. Instead of being questioned about hospitalizations, a form to be filled out by the family was left with the respondent. Nonresponses were followed up using the same techniques as for Procedure B.

### The Interviewers

Twenty interviewers were employed for this study. Most of them had had a limited amount of interviewing experience, largely on the Decennial Census. The decision to use new interviewers was based on several considerations. The existing Census staff in the Detroit area was fully occupied. In addition, it was felt that new interviewers would be less likely to perceive that the rate of hospitalizations in the sample was abnormally high. Of greatest importance, however, was the need for training interviewers in new techniques without having them recognize that the techniques were different from the usual National Health Survey interview procedures. It was felt to be very important to keep the interviewers from knowing that this was a study of hospitalizations, since they might probe with greater zeal. Specifically, it was feared, the knowledge that there was

at least one hospitalization for each family would have motivated them to probe until a hospitalization was reported.

Interviewers were trained by the Bureau of the Census using, in general, their usual training procedures. The interviewers were divided randomly into two groups; one for Procedures A and C, and the other for Procedures B and C. The training for the two groups was made as comparable as possible.

Since it was expected that interviewers would improve their skill with experience, the week of interviewing was used as one of the controls in the research design.

#### Assignment of Interviewers

Interviewers were given assignments to be completed within the week. They were given the family name and address from the hospital records. In cases where the family name was found to be different from that assigned, no interview was taken at that address. The usual quality controls used by the Bureau of the Census on National Health Survey data were used also on this study. Questionnaires were edited for missing information and inconsistencies. Where necessary the missing information was obtained by telephone or a personal visit.

#### Follow-up Techniques

Procedures B and C included self-administered questionnaires; the Procedure C interviewer leaving the questionnaire at the household at the completion of the interview, and the Procedure B, self-administered questionnaire, being mailed to respondents. The Procedure B interviewers were presumably unaware that the follow-up was being conducted, at least until the third week when one interviewer was employed to follow up nonresponses.

All self-administered forms were edited upon reaching the office. Maximum use of the telephone was made to obtain missing data. When respondents had no telephone, personal visits were made.

Nonresponse was followed up by: first, a mail inquiry to those who had not responded within a week of initial contact, and second, personal visits or telephone calls to those not responding to the mail inquiry.

#### Deviations From the Design

The study, as it was carried out, deviated from the design in three ways. First, if a sample family was found to have moved to another region of the city, the interviewer to whom the assignment was originally made was instructed to follow that family and conduct the interview. Second, in some cases, if the family was not found at home or if the assignment could not be completed during the week in which it was assigned, the family was interviewed during the following week. Third, two interviewers were unable to complete the study assignments. One was dropped during the fourth week, and another did not interview during the fifth week. In each case, the incompleting interviews were reassigned to another interviewer who was working in the same region and who was using the same procedures.

#### Editing, Matching, and Coding

The editing and coding was carried out by a trained group of coders on the Survey Research Center staff. Three distinct tasks were involved in the editing: the matching of persons, the re-editing of episodes, and the matching of episodes.

To determine whether or not the person whose hospitalizations were sampled was included in the household, age, race, sex, and name were used as criteria. In general, this was not a complex task, as it was usually clear whether or not the sample person was in the household.

Because the interviewing took place over the period of a month, some of the episodes fell outside of the reference year. The reference year differed for the procedures. For Procedure A the year was the 365 days preceding the Sunday night of the interviewing week. For Procedures B and C the year was the 12 months preceding the month in which the interviewing took place. To be in the sample the hospital discharge had to be within the reference year. Other episodes were excluded from the sample for other reasons. (For instance, a woman who was hospitalized twice, once for a delivery and once for an episode which proved to be outside of the reference year, was excluded from the sample, since her only episode during the reference year was for a delivery.) All hospital discharges were edited to ascertain that they truly were within the scope of the study.

In matching episodes, it was occasionally difficult to determine whether or not the some-

time-vague and inaccurate reports found in the interview actually referred to the episode for which there was a hospital discharge record. The length of stay, month, diagnosis, name of hospital and, in the case where surgery was performed, the type of operation, were all used as criteria for matching. When three of these characteristics were reported with reasonable accuracy and the other two were not too inconsistent, the episodes were considered to be matched.

If there was a major inconsistency, especially if the hospital seemed to have been reported incorrectly, the decisions were made by the supervisors. For every interview, the editing and matching was checked independently by one of the researchers or the coding supervisor. Disagreement was resolved by consensus. Although the process was of necessity somewhat arbitrary, 85 percent of the cases included only one episode for a person, and in these cases it was usually clear whether or not the episode had been reported.

The coding was unusually accurate. In checking about 15 percent of the coding, it was found that the reliability was 0.99, when calculated in terms of the percent of variables which were coded correctly. This small percentage of error was further reduced by intensive consistency checks of the cards.

## COMPARISON OF UNDERREPORTING IN THE THREE PROCEDURES BY CHARACTERISTICS OF THE SAMPLE PERSON

The primary purpose of this study was to compare two experimental procedures with a control procedure, i.e., the one used by the National Health Survey, to determine whether either or both show a significant improvement in the level at which hospitalizations are reported and to investigate ways in which underreporting rates for the procedures differ in relation to the characteristics of persons who are hospitalized.

To gain added confidence that results obtained were not due to differences between samples rather than differences between procedures, demographic characteristics of the three samples were compared. Those differences found were well within chance fluctuation, as would be expected from any probability sampling design carefully carried out.

The rates of underreporting of hospital episodes in the three procedures are compared in table A. The difference between the net underreporting rate of 6 percent for Procedure B and a rate of 14 percent for both Procedures A and C is statistically significant. (Standard errors of estimates may be found in Appendix I.) The reporting rate\* for Procedure B includes the episodes reported in the mail follow-up. The results of the follow-up procedures are discussed in the following section.

When the overreports are excluded, the underreporting rate is 17 percent for Procedure A, 9 percent for Procedure B, and 16 percent for Procedure C. Considering only the direct interview for Procedure B, the underreporting rate was 12 percent.

Table 1\*\* shows that Procedure B produced a sizable reduction in underreporting compared with Procedures A and C for both males and females. The underreporting rate was lower for males than for females (4 percent and 7 percent, respectively). Similarly, table 2 indicates Procedure B was superior to Procedure A for all age groups. The largest difference is for the group 55 years or older where there was a net underreporting rate of zero in Procedure B. However, differences for all age groups are significantly lower in Procedure B than in Procedure A. The underreporting for white and nonwhite sample persons is compared in table 3. For all procedures the rate of underreporting for nonwhite was about twice that for white persons. While Procedure B showed a substantial reduction in underreporting for both groups, the same two to one ratio is found in all procedures.

Table 4 shows the comparisons of underreporting by family income. Procedure B showed a significant improvement in reporting episodes for both low and high income groups (those above and below \$7,000). Within Procedures B and C persons with family incomes above \$7,000 were significantly lower in underreporting than those in lower income groups. The pattern is observed also within Procedure A. Here, as in table 5, it can be observed that while Procedure B showed

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\*This rate takes into consideration the episodes reported in the interviews that could not be matched with hospital records; these unmatched reports are referred to as "overreports." Experience in Special Study No. 8 suggests that a number of the episodes were classified as overreports in error due to failure to locate the records in the hospitals.

\*\*Tables designated by arabic numerals are shown in the section following the text.



Table A. Percent of hospital episodes underreported in the survey, by survey procedure

Survey procedure	Hospital discharges			Number of episodes reported in the survey not correspondingly matched (overreports)	Percent* underreported (including overreports)
	Total	Number not matched with interview report	Percent under-reported		
A-----	521	90	17	17	14
B-----	558	48	9	16	6
C-----	546	87	16	12	14

\*This percentage is the ratio of total unreported episodes plus overreported episodes to total hospital discharges.

improvement, the patterns of underreporting remained consistent between the groups.

The relationship between education of the sample person and reporting rates can be seen in table 5. Combining the groups, as shown in table B, the underreporting rates in Procedures A and B for persons who had not graduated from high school were about the same as the rates for those with higher education. For Procedure C, however, hospital episodes were reported better for those with at least a high school education, than for those in the lower educational group. This relationship possibly reflects a greater ease of handling self-administered forms by persons with higher education.

Table 6 shows the level of underreporting by the relationship of the sample person to the respondent. In Procedure A, respondents reported better for themselves than they did for others. This seems to be true for Procedure C respondents also, but the picture is not clear.

In Procedure C the data are confused by the fact that a number of people did not sign the follow-up forms; and often the interviewers did not record the name of the person with whom they talked when they had to follow-up via telephone or personal visit. This group, probably the least cooperative and the least willing to report, is most prone to underreport; their underreporting rate being about 50 percent higher than the next highest rate. For those cases in which the respondent could be identified, respondents reported best for themselves.

In contrast, the relationship observed in Procedure A is eliminated by Procedure B. Persons

Table B. Percent of hospital episodes underreported in the survey for persons 17 years of age and over, by survey procedure and education of the sample person, including and excluding overreports

Survey procedure and education of sample person-17+ years	Percent under-reported	
	Including over-reports	Excluding over-reports
<u>Procedure A</u>		
Less than high school graduate--	14	19
High school graduate or more-----	13	16
<u>Procedure B</u>		
Less than high school graduate--	5	10
High school graduate or more-----	6	8
<u>Procedure C</u>		
Less than high school graduate--	16	15
High school graduate or more-----	10	12

reported just as well for others as they did for themselves. Indeed, this is one of the obvious ways in which Procedure B was an improvement over Procedures A and C, and offers one answer to the question of what was accomplished with Procedure B, which enabled the underreporting to be reduced so drastically.

In conclusion, it is worth noting that the overall reporting in Procedure B was significantly better than in Procedures A and C.

## COMPARISON OF UNDERREPORTING IN THE THREE PROCEDURES BY CHARACTERISTICS OF THE EPISODES

Turning from characteristics of sample persons to a consideration of some characteristics of the episodes, table 7 shows that all three procedures resulted in better reporting for episodes involving longer hospitalization.

Procedure B was superior to the other procedures in evoking reports of episodes of greater than one day. Procedure C showed a decrease in underreporting as the stays became longer, but the underreporting was consistently higher than for Procedure B. The pattern in Procedure A is not entirely clear, probably because of the small number of episodes in some categories. Procedure B did not result in improved reporting of one-day stays, but there was an obvious improvement in the reporting of stays longer than a day. The one-day stays, however, were reported as poorly in Procedure B as they were in Procedures A or C.

The "diagnostic rating" in table 8 refers to a subjective scale of the degree of threat which is involved in a given diagnosis.\* Included in this are two concepts, physical threat, or the medical seriousness of the diagnosis, and psychological and social threat, especially the social acceptability of a problem. For example, having a baby is quite socially acceptable, and therefore would be easily reported, even to a stranger such as the interviewer; but a psychotic breakdown or delirium tremens would detract from one's social image, and therefore would be less readily reported.

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\*This rating was devised for Special Study No. 8 and a more detailed description of the ratings can be found in the report of that study.

As can be seen, the effects of threat were marked in all three procedures. The underreporting rate for all degrees of threat was lowered with the use of Procedure B but the pattern was the same as for Procedures A and C, i.e., an increase in underreporting with an increase in the level of threat.

It was hoped that a self-administered form would make it easier for the respondent to report an embarrassing episode, since writing about it would seem to be easier than reporting it to a stranger; but the pattern was not changed with the use of Procedure C.

Table 9 shows a comparison of the three procedures for hospitalization with and without accompanying surgery. The differences between the underreporting rates for surgical and nonsurgical treatment are statistically significant for all three procedures. Although the reporting for both types of episodes was improved in Procedure B, the pattern between type of treatment remained. It is undoubtedly true that episodes involving surgery have greater emotional impact on the person and his family than nonsurgical hospitalizations, and are therefore more readily recalled. Surgical episodes are also likely to involve longer hospitalizations and, longer stays are reported more completely as shown in table 7.

Preceding tables have shown that underreporting of hospital episodes varies with the impact of the episodes on the respondent. Another variable closely related to impact is the recency of the event. It has been found repeatedly that events closer to the present are recalled more accurately than those farther back. Table 10 shows a comparison of episodes by the elapsed time between the hospital discharge and the interview. All three procedures showed an increase in underreporting as the time between the hospitalization and the interview became longer. The differences between the underreporting rates for the first 30 weeks and the remaining weeks are statistically significant.

Procedure B was somewhat different from the others in that the rate of underreporting was relatively flat through 40 weeks, with a rise in the period over 40 weeks.

It should be recalled here that the reference period presented to the respondent was different for Procedure A than for Procedures B and C. In Procedure A the period was one year preceding the interview week. For Procedures B and C it was the part of 1961 which preceded the interview plus all of 1960. The hope was that this change would help substantially to overcome the large underreporting rate of episodes which terminated

near the end of the reference year. Both Procedures B and C showed an improvement in this year-end effect, but in neither procedure was the effect eliminated.

Table 11 shows the underreporting of hospitalizations by the number of hospital recorded episodes experienced by the sample person during the reference year. In all procedures when the sample person had three or more episodes during the reference period, the underreporting rate was higher than for fewer episodes. Interestingly enough, there is very little difference in reporting rates for persons with one and two hospitalizations. Again it is noted that the pattern in Procedure B is similar to that found in Procedures A and C, but the rate is lower for each group.

In conclusion, this section has presented convincing evidence for the importance of the characteristics of the episodes themselves in problems of reporting. All of these characteristics which would make a hospital stay less psychologically relevant—one-day stays, nonsurgical stays, and time-distant stays—are reported very poorly. The one contradictory bit of evidence is that high threat episodes are reported more poorly, even though they should have more impact on the respondent. Two solutions to this latter point are presented. First, it may be explained by stating that persons remember such episodes, but do not want to talk about them with an interviewer. Second, one can draw upon personality theory and postulate that the person does not even think about some threatening illnesses; that he keeps them out of consciousness to the point that it is difficult for him to recall them in an interview situation. The latter is consistent with findings of this study in relation to the other types of episodes that are not reported. In all probability, the consistent patterns found with threat ratings was due to a combination of both of these factors.

Procedure B shows a consistently lower rate of underreporting and significantly improved reporting in certain subgroups. It was not successful however in eliminating some patterns of underreporting, such as episodes involving one-day stays, and those episodes 40 weeks or more prior to the interview.

## FOLLOW-UP TO PROCEDURES B AND C

Both Procedures B and C included self-administered forms for the reporting of hospitalizations. Procedure C relied entirely on the self-ad-

ministered form for information on hospitalization. In Procedure B, however, all households where interviews had been completed were mailed a questionnaire for the purpose of eliciting hospitalizations which were not reported in the interviews. A brief description of both procedures is given in the first section of this report. The questionnaires used are shown in Appendix II.

Follow-up to the self-administered procedure for nonresponse included one mail inquiry to all sample households not responding within a week of initial contact. Further follow-up to those not responding to the mail inquiry was made by telephone where possible and by personal visits when a telephone contact could not be made.

The reason for using a follow-up questionnaire in Procedure B was the finding from Special Study No. 8 that a personal follow-up interview was successful in obtaining episodes not originally reported. It was felt that a mail follow-up might achieve the same results and be financially feasible in the National Health Survey.

Table C shows that for Procedure B, 96 percent of the episodes finally obtained were reported during the interview. The follow-up procedures produced an additional 21 episodes. This resulted in a reduction of 3 percentage points in the underreporting rate, from 9 percent to 6 percent including overreports, or 12 percent to 9 percent, excluding overreports (table D).

Along most dimensions the 21 episodes which were reported in the follow-up for Procedure B were evenly distributed. There were, however, several groups for which the follow-up procedure was particularly effective in reducing the underreporting. The most obvious of these is that 11 of the 21 episodes were reported by parents for children under 17 years of age. This reduced the underreporting rate for children from 13 percent without the follow-up to 6 percent when the follow-up episodes were added (table E). Note also in table E that self-respondents reported no better in the direct interview part of Procedure B than they did in the other procedures. However, the Procedure B interview was especially effective in eliciting hospital episodes from respondents answering for other adults.

The second largest reduction in the underreporting rate was for nonwhite sample persons. The rate for white persons was only slightly affected, but the nonwhite underreporting rate was reduced from 21 percent to 10 percent when the follow-up reports were added.

Two income groups show marked improvement as a result of the follow-up report. The underreporting rate for persons with an annual in-

Table C. Number and percent distribution of hospital episodes reported in Procedure B, by manner in which hospitalization report was obtained, including and excluding overreports

Manner in which hospitalization report was obtained	Including overreports		Excluding overreports	
	Number	Percent	Number	Percent
Total-----	526	100	510	100
Household interview-----	505	96	490	96
First mail form-----	10	2	10	2
Second mail form-----	3	1	3	1
Telephone or personal follow-ups-----	8	1	7	1

Table D. Cumulative number and percent of underreporting of hospital episodes in Procedure B, by manner in which hospitalization report was obtained, including and excluding overreports

Manner in which hospitalization report was obtained	Including overreports		Excluding overreports	
	Cumulative interview reports	Cumulative percent under-reported*	Cumulative interview reports	Cumulative percent under-reported*
Household interview-----	505	9	490	12
First mail form-----	515	8	500	10
Second mail form-----	518	7	503	10
Telephone or personal follow-ups----	526	6	510	9

\*The cumulative percentage of 558 hospital episodes from hospital records which had not been reported after each respective stop was completed.

Table E. Comparison of underreporting of hospital episodes for Procedure B, with and without follow-up, with Procedures A and C, by type of respondent

Type of respondent	Procedure A	Procedure B		Procedure C
	Percent underreported	Percent underreported		Percent underreported
		With follow-up	Without follow-up	
Self-----	10	6	9	9
Proxy for adult-----	21	6	8	16
Proxy for child-----	15	6	13	12

come of less than \$2,000 was reduced from 25 percent to 11 percent by the addition of the follow-up reports; the underreporting rate for persons in the \$7,000-10,000 category dropped from 8 percent to 3 percent.

A consideration of the follow-up reports in terms of diagnostic rating reveals no differences between high and low threat episodes. For all three categories, about one third of the episodes not reported in the interview were reported in the follow-up.

It was thought that the follow-up might help pick up the very short stays which tend to be forgotten. In fact, the opposite was true. Of the 32 five or more stays not reported in the interview, 11 were reported in the follow-up; but only 2 of 14 unreported one-day stays were obtained in the follow-up. It can be concluded from this that respondents generally did not consult records to fill out the follow-up questionnaire, that the kinds of episodes which were reported in the follow-up were important episodes which were not likely to be forgotten. Actually since the numbers are small, no definite conclusions are made. But at least it seems safe to state that the short, easily forgotten stays, which the respondent is not likely to remember on the spur of the moment, were not well reported in the follow-up in Procedure B.

In regard to the interval between the hospital discharge and the interview, an interesting phenomenon occurred. No hospital episodes within 10 weeks of the interview were reported in the follow-up. And, although there were 46 underreports after the interview among episodes which occurred 31 weeks or more before the interview, only 10 were reported in the follow-up. The greatest improvement in reporting, therefore, pertained to episodes which occurred 10 to 30 weeks prior to

the interview. For these, the underreporting rate was reduced from 8 percent to 3 percent when the follow-up reports were added.

These data indicate that the follow-up questionnaire of Procedure B is capable of reducing substantially the number of hospital episodes not reported in household interviews. In general, the follow-up was most effective among groups in which the underreporting rate was still high after the interview. The exception was among hard-core-like episodes with one-day duration, "threatening" diagnoses, and episodes which occurred more than 30 weeks prior to the interview.

This suggests that the follow-up would have produced more striking effects than it did had it been used in connection with less successful Procedure A.

For the self-administered form in Procedure C, table F shows the percent distribution of returns. Three fourths of the questionnaires left with the respondent by the interviewer were returned without follow-up. As shown in table G, had no follow-up been made, over one third of the episodes would not have been reported.

Tables H and I, show underreporting rates by the manner in which the hospitalization report was obtained. Underreporting rates by the person who filled out the follow-up forms for both Procedures B and C are shown in table 12. It is felt that these tables relate more to the characteristics of respondents than they do to the follow-up procedures.

Tables H and I indicate that the persons who mailed in the first or second forms were much more inclined to report hospitalizations than those who had to be contacted a third time, either by telephone or by a personal visit. The implications of these tables seem to be apparent. Persons who

Table F. Number and percent distribution of hospital episodes reported in Procedure C, by manner in which hospitalization report was obtained, including and excluding overreports

Manner in which hospitalization report was obtained	Including overreports		Excluding overreports	
	Number	Percent	Number	Percent
Total-----	471	100	459	100
First mail form-----	349	74	343	75
Second mail form-----	65	14	64	14
Telephone or personal follow-up-----	57	12	52	11

Table G. Cumulative number and percent of underreporting of hospital episodes in Procedure C, by manner in which hospitalization report was obtained, including and excluding overreports

Manner in which hospitalization report was obtained	Including overreports		Excluding overreports	
	Cumulative interview reports	Cumulative percent under-reported	Cumulative interview reports	Cumulative percent under-reported
First mail form-----	349	36	343	37
Second mail form-----	414	24	407	25
Telephone or personal follow-up----	471	14	459	16

Table H. Number and percent of underreporting for procedure B, by the manner in which hospitalization report was obtained, including and excluding overreports

Manner in which hospitalization was obtained	Including overreports			Excluding overreports		
	Interview reports	Hospital records	Percent under-reported	Interview reports	Hospital records	Percent under-reported
Total-----	526	558	6	510	558	9
First mail form-----	371	388	4	361	388	7
Second mail form-----	68	72	6	66	72	8
Telephone or personal follow-up-----	85	95	11	81	95	15
Unknown-----	2	3	(*)	2	3	(*)

Table I. Number and percent of underreporting of hospital episodes in Procedure C, by the manner in which hospitalization report was obtained, including and excluding overreports

Manner in which hospitalization report was obtained	Including overreports			Excluding overreports		
	Interview reports	Hospital records	Percent under-reported	Interview reports	Hospital records	Percent under-reported
Total-----	471	546	14	459	546	16
First mail form-----	349	394	11	343	394	13
Second mail form-----	65	75	13	64	75	15
Telephone or personal follow-up-----	57	77	26	52	77	32

were prone to co-operate with the study would do so both by reporting hospitalizations thoroughly and by returning the mail form promptly. Those who had to be contacted repeatedly seemed to be less interested and unwilling to be helpful.

In a similar vein, table 12 shows that it makes considerable difference whether or not the sample person or the person who was originally interviewed completed the self-administered form. One obvious hypothesis is that a respondent who was interested in a study would sit down and fill out the form herself, while a less interested respondent might give it to someone else to complete. Another relevant point would seem to be that the original interview respondent would be more familiar with the reasons for which the study was being conducted through contact with the interviewer than, for instance, her husband, and therefore might do a more thorough job of filling out the form.

An added by-product of the follow-up to Procedure B was the use of the data to correct information obtained in the interview. Thirty-six of 490 interview reports (7 percent) were corrected in some significant way by the use of information obtained in the follow-up. Most of these corrections related to reported length of stay, month of discharge, or diagnosis.

## COMPARISON OF UNDERREPORTING IN THE THREE PROCEDURES BY CHARACTERISTICS OF THE RESPONDENTS

This study was not designed to permit a very satisfactory analysis of the reasons why one procedure performed better than another in obtaining hospitalizations. Except for the mail follow-up to Procedure B, this was an "all or none" design; that is, if one procedure was significantly better than the other, this procedure would need to be adopted in its entirety since the factors leading to improvement could not be isolated. However, certain tendencies in the data do support hypotheses as to the reasons for the outcome of the various procedures. In this section the focus is on the characteristics of respondents to see whether significantly different patterns of reporting are obtained by the three procedures. It should be remembered that about 40 percent of the respondents were reporting for themselves and the remainder for some other family member.

Table 13 shows the reporting rates by survey procedure and sex of the respondent. For all procedures the underreporting rates were lower for female respondents than for males. However, except for Procedure C, the differences are not statistically significant. For both men and women respondents, Procedure B shows a considerably lower rate of underreporting than Procedures A and C.

Another point of interest is that a higher proportion of respondents in Procedure C were male; 28 percent for Procedure C compared with 19 percent for Procedure A and 17 percent for Procedure B. For 73 episodes the sex of the respondent was unknown. However, there is no indication that these were predominantly female. It can be hypothesized that filling in a questionnaire is part of the role of the male family head. If this hypothesis is true, a sizable number of persons filling in the mail form on Procedure C were different from the respondents in the interview part of Procedure C. Thus, if the interviewer did anything to instruct the interview respondent or motivate him to fill out the mail form, the effort was either wasted or at best transmitted indirectly to the person who actually filled out the form. This could account for the higher underreporting rate for male respondents in Procedure C.

Table 14 shows that in Procedure A, older respondents tend to be poorer reporters of hospital episodes than younger respondents. This is consistent with previous findings in Special Study No. 8. The relationship with age disappears in Procedures B and C. The reason for this difference is not apparent.

The relationship between the education of the respondent and the underreporting of hospital episodes can be seen in table 15. There is a clear pattern in Procedure A—the higher the educational level, the better the reporting. This pattern does not show up in Procedures B and C. In fact, one of the impressive differences between Procedures A and B was the significantly better reporting of hospitalizations among the lower educational groups in Procedure B, in which there were essentially no differences in underreporting attributable to the educational level.

The findings for Procedure C are not clear because of the large group for which the respondent could not be ascertained. Disregarding this, the education of the respondent has only a slight effect on reporting of hospitalizations.

In the interviews, respondents were asked to report chronic and acute conditions experienced by members of the family. Table 16 shows the relationship between the number of these condi-

tions reported for the sample person and the rate of underreporting of hospital episodes. It seems clear for all three procedures, that the underreporting rate decreased as the number of conditions reported for the sample person increased. This relationship is also evident, but to a lesser degree, when underreported episodes are distributed by the number of conditions reported for the respondent.

There are several factors which might explain this relationship. (1) A respondent who tends to be particularly conscious of health conditions of himself and his family may be more likely to recall illnesses as well as hospitalizations; (2) the sample person may be considered to be "ailing" and the reporting is a reflection of this perception; (3) that persons for whom several conditions were reported tended to have had recent (and, hence, better reported) hospitalizations; and (4) that reporting both hospitalizations and illnesses is an index of how hard the respondent tries to give information. If this is so, then reporting can be considered as an indication of the level of motivation of the respondent to report.

Except for the mail follow-up of Procedure B where a reduction in the underreporting rate of 3 percentage points was obtained, it is not clear how much difference each change in procedure made in reporting of episodes. From the patterns reported above, it may be that asking about each family member individually and asking additional probes were useful to stimulate memory and improved reporting, particularly among proxy respondents. Also it may be that these factors assisted older persons in recalling episodes more readily.

Reduction in underreporting for episodes of short duration and for those some time prior to the interview may be attributable to the added probes, one of which specifically asked for short stays and distant episodes.

### ACCURACY OF REPORTING LENGTH OF STAY AND DATE OF DISCHARGE

The preceding analysis has included only one type of reporting accuracy, the completeness with

which persons report hospitalizations. There is another aspect of reporting which is also important in evaluating field procedures, namely, the accuracy with which details of hospitalizations are reported. One aspect of this question would be the accuracy of reported diagnoses but unfortunately there are very few cases in any given diagnostic category, thus the data are not very meaningful. Another consideration is the accuracy with which the month of discharge and length of stay were reported.

It was expected that a self-administered form, such as was used in Procedure C, would provide an opportunity for persons to refer to records, consult other members of the family, and generally give more time and thought to their responses. While Procedure C did not substantially increase the percentage of hospitalizations reported, tables 17 and 18 show that the information that was obtained about hospital episodes tended to be more accurate than the information in either Procedures A or B.

The tables are generally self-explanatory. Slightly better reports on the month of discharge was obtained with Procedure C, and the improvement over Procedure A is even more marked in the reporting of the length of stay. Slightly more accurate reports with Procedure B were obtained on the length of stay, than Procedure A, but was essentially no more accurate than Procedure A on the month of discharge.

An interesting feature of table 17 is that misreporting of the month of discharge in Procedure A tended to err in the direction of understating the interval of time that had lapsed since the hospitalization, while in Procedure B the reverse seemed to be true. The numbers involved, however, are quite small. There is a consistent tendency in all three procedures for the length of stay to be exaggerated.

With respect to accuracy of information collected, Procedure C seemed to be superior to both of the other procedures, supporting the hypothesis that respondents who take the time to fill out a self-administered form can do a better job than those who respond to an interview. The data suggest that the primary obstacle in Procedure C is to motivate respondents to take the time to complete the form.



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Table 1. Percent of hospital episodes underreported, by survey procedure and sex of sample person, including and excluding overreports

Survey procedure and sex of sample person	Including overreports			Excluding overreports		
	Interview reports	Hospital records	Percent underreported	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>						
Total-----	448	521	14	431	521	17
Male-----	194	229	15	184	229	20
Female-----	254	292	13	247	292	15
<u>Procedure B</u>						
Total-----	526	558	6	510	558	9
Male-----	231	240	4	223	240	7
Female-----	295	318	7	287	318	10
<u>Procedure C</u>						
Total-----	471	546	14	459	546	16
Male-----	220	255	14	217	255	15
Female-----	251	291	14	242	291	17

Table 2. Percent of hospital episodes underreported, by survey procedure and age of sample person, including and excluding overreports

Survey procedure and age of sample person	Including overreports			Excluding overreports		
	Interview reports	Hospital records	Percent underreported	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>						
Total-----	448	521	14	431	521	17
0-17 years-----	138	162	15	136	162	16
18-34 years-----	100	111	10	98	111	12
35-54 years-----	111	132	16	104	132	21
55 years or over-----	99	116	15	93	116	20
<u>Procedure B</u>						
Total-----	526	558	6	510	558	9
0-17-----	151	161	6	149	161	7
18-34 years-----	114	121	6	112	121	7
35-54 years-----	149	163	9	144	163	12
55 years or over-----	112	112	0	105	112	6
Unknown-----	0	1	(*)	0	1	(*)
<u>Procedure C</u>						
Total-----	471	546	14	459	546	16
0-17 years-----	136	156	13	133	156	15
18-34 years-----	88	103	15	88	103	15
35-54 years-----	146	172	15	141	172	18
55 years or over-----	101	115	12	97	115	16

Survey procedure and race of sample person	Including overreports			Excluding overreports		
	Interview reports	Hospital records	Percent underreported	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>						
Total-----	448	521	14	431	521	17
White-----	398	454	12	382	454	16
Nonwhite-----	50	67	25	49	67	27
<u>Procedure B</u>						
Total-----	526	558	6	510	558	9
White-----	457	481	5	444	481	8
Nonwhite-----	69	77	10	66	77	14
<u>Procedure C</u>						
Total-----	471	546	14	459	546	16
White-----	409	464	12	399	464	14
Nonwhite-----	62	82	24	60	82	27

Table 4. Percent of hospital episodes underreported, by survey procedure and family income, including and excluding overreports

Survey procedure and family income	Including overreports			Excluding overreports		
	Interview reports	Hospital records	Percent underreported	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>						
Total-----	448	521	14	431	521	17
Under \$4,000-----	92	103	11	87	103	16
\$4,000-6,999-----	166	199	17	158	199	21
\$7,000-9,999-----	108	120	10	105	120	12
\$10,000 or over-----	73	85	14	72	85	15
Unknown-----	9	14	36	9	14	36
<u>Procedure B</u>						
Total-----	526	558	6	510	558	9
Under \$4,000-----	109	119	8	104	119	13
\$4,000-6,999-----	215	226	5	207	226	8
\$7,000-9,999-----	106	109	3	105	109	4
\$10,000 or over-----	84	89	6	82	89	8
Unknown-----	12	15	20	12	15	20
<u>Procedure C</u>						
Total-----	471	546	14	459	546	16
Under \$4,000-----	115	131	12	110	131	16
\$4,000-6,999-----	140	173	19	138	173	20
\$7,000-9,999-----	111	122	9	108	122	11
\$10,000 or over-----	85	96	11	84	96	12
Unknown-----	20	24	17	19	24	21

Table 5. Percent of hospital episodes underreported, by survey procedure and education of sample person, including and excluding overreports

Survey procedure and education of sample person	Including overreports			Excluding overreports		
	Interview reports	Hospital records	Percent underreported	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>						
Total-----	448	521	14	431	521	17
0-8 years elementary school-----	88	103	15	83	103	19
1-3 years high school---	84	96	12	79	96	18
4 years high school-----	98	108	9	94	108	13
1 year of college or more-----	42	53	21	41	53	23
Inappropriate (child under 17)-----	135	158	15	133	158	16
Unknown-----	1	3	(*)	1	3	(*)
<u>Procedure B</u>						
Total-----	526	558	6	510	558	9
0-8 years elementary school-----	118	128	8	113	128	12
1-3 years high school---	96	98	2	91	98	7
4 years high school-----	112	120	7	110	120	8
1 year of college or more-----	49	51	4	47	51	8
Inappropriate (child under 17)-----	145	155	6	143	155	8
Unknown-----	6	6	(*)	6	6	(*)
<u>Procedure C</u>						
Total-----	471	546	14	459	546	16
0-8 years elementary school-----	99	120	17	95	120	21
1-3 years high school---	89	105	15	86	105	18
4 years high school-----	94	108	13	93	108	14
1 year of college or more-----	52	55	5	51	55	7
Inappropriate (child under 17)-----	133	153	13	130	153	15
Unknown-----	4	5	(*)	4	5	(*)

Table 6. Percent of hospital episodes underreported, by survey procedure and relationship of sample person to respondent, including and excluding overreports

Survey procedure and relationship of sample person to respondent	Including overreports			Excluding overreports		
	Interview reports	Hospital records	Percent underreported	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>						
Total-----	448	521	14	431	521	17
Self-respondent-----	209	231	10	202	231	13
Sample person is child of respondent-----	134	158	15	132	158	16
Sample person is adult but not self-respondent-----	100	126	21	92	126	27
Unknown-----	5	6	(*)	5	6	(*)
<u>Procedure B</u>						
Total-----	526	558	6	510	558	9
Self-respondent-----	241	257	6	231	257	10
Sample person is child of respondent-----	146	155	6	144	155	7
Sample person is adult but not self-respondent-----	136	144	6	133	144	8
Unknown-----	3	2	(*)	2	2	(*)
<u>Procedure C</u>						
Total-----	471	546	14	459	546	16
Self-respondent-----	162	179	9	160	179	11
Sample person is child of respondent-----	119	135	12	116	135	14
Sample person is adult but not self-respondent-----	129	153	16	125	153	18
Unknown-----	61	79	23	58	79	27

Table 7. Percent of hospital episodes underreported, by survey procedure and number of days in hospital, from hospital records, excluding overreports

Survey procedure and number of days in hospital	Excluding overreports		
	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>			
Total-----	431	521	17
1 day-----	39	49	20
2-4 days-----	122	154	21
5-7 days-----	105	125	16
8-14 days-----	111	127	13
15 days or more-----	54	66	18
<u>Procedure B</u>			
Total-----	510	558	9
1 day-----	44	56	21
2-4 days-----	169	184	8
5-7 days-----	98	109	10
8-14 days-----	130	136	4
15 days or more-----	69	73	5
<u>Procedure C</u>			
Total-----	459	546	16
1 day-----	34	42	19
2-4 days-----	145	178	19
5-7 days-----	102	119	14
8-14 days-----	107	126	15
15 days or more-----	71	81	12

Table 6. Percent of hospital episodes underreported, by survey procedure and relationship of sample person to respondent, including and excluding overreports

Survey procedure and relationship of sample person to respondent	Including overreports			Excluding overreports	
	Interview reports	Hospital records	Percent underreported	Interview reports	Hospital records
<u>Procedure A</u>					
Total-----	448	521	14	431	521
Self-respondent-----	209	231	10	202	231
Sample person is child of respondent-----	134	158	15	132	158
Sample person is adult but not self-respondent-----	100	126	21	92	126
Unknown-----	5	6	(*)	5	6
<u>Procedure B</u>					
Total-----	526	558	6	510	558
Self-respondent-----	241	257	6	231	257
Sample person is child of respondent-----	146	155	6	144	155
Sample person is adult but not self-respondent-----	136	144	6	133	144
Unknown-----	3	2	(*)	2	2
<u>Procedure C</u>					
Total-----	471	546	14	459	546
Self-respondent-----	162	179	9	160	179
Sample person is child of respondent-----	119	135	12	116	135
Sample person is adult but not self-respondent-----	129	153	16	125	153
Unknown-----	61	79	23	58	79

Table 7. Percent of hospital episodes underreported, by survey procedure and number of days in hospital, from hospital records, excluding overreports

Survey procedure and number of days in hospital	Excluding overreports		
	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>			
Total-----	431	521	17
1 day-----	39	49	20
2-4 days-----	122	154	21
5-7 days-----	105	125	16
8-14 days-----	111	127	13
15 days or more-----	54	66	18
<u>Procedure B</u>			
Total-----	510	558	9
1 day-----	44	56	21
2-4 days-----	169	184	8
5-7 days-----	98	109	10
8-14 days-----	130	136	4
15 days or more-----	69	73	5
<u>Procedure C</u>			
Total-----	459	546	16
1 day-----	34	42	19
2-4 days-----	145	178	19
5-7 days-----	102	119	14
8-14 days-----	107	126	15
15 days or more-----	71	81	12



Table 8. Percent of hospital episodes underreported, by survey procedure and diagnostic rating from hospital records, excluding overreports

Survey procedure and diagnostic rating	Excluding overreports		
	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>			
Total-----	431	521	17
Most threatening-----	66	84	21
Somewhat threatening-----	92	111	17
Not threatening-----	272	325	16
Unknown-----	1	1	(*)
<u>Procedure B</u>			
Total-----	510	558	9
Most threatening-----	97	110	12
Somewhat threatening-----	117	127	8
Not threatening-----	292	315	7
Unknown-----	4	6	(*)
<u>Procedure C</u>			
Total-----	459	546	16
Most threatening-----	70	89	21
Somewhat threatening-----	85	102	17
Not threatening-----	302	353	14
Unknown-----	2	2	(*)

Table 9. Percent of hospital episodes underreported, by survey procedure and type of treatment, from hospital records, excluding overreports

Survey procedure and type of treatment	Excluding overreports		
	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>			
Total-----	431	521	17
Surgical-----	262	297	12
Nonsurgical-----	168	223	25
Unknown-----	1	1	(*)
<u>Procedure B</u>			
Total-----	510	558	9
Surgical-----	313	334	6
Nonsurgical-----	193	218	11
Unknown-----	4	6	(*)
<u>Procedure C</u>			
Total-----	459	546	16
Surgical-----	286	326	12
Nonsurgical-----	171	218	22
Unknown-----	2	2	(*)

Table 10. Percent of hospital episodes underreported, by survey procedure and number of weeks between hospital discharge and interview, excluding overreports

Survey procedure and number of weeks between hospital discharge and interview	Excluding overreports		
	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>			
Total-----	431	521	17
1-10 weeks-----	49	52	6
11-20 weeks-----	112	123	9
21-30 weeks-----	89	100	11
31-40 weeks-----	97	122	20
41-53 weeks-----	84	124	32
<u>Procedure B</u>			
Total-----	510	558	9
1-10 weeks-----	47	51	8
11-20 weeks-----	126	130	3
21-30 weeks-----	114	118	3
31-40 weeks-----	115	126	9
41-53 weeks-----	108	133	19
<u>Procedure C</u>			
Total-----	459	546	16
1-10 weeks-----	48	56	14
11-20 weeks-----	116	129	10
21-30 weeks-----	91	104	12
31-40 weeks-----	99	122	19
41-53 weeks-----	105	135	22

Table 11. Percent of hospital episodes underreported, by survey procedure and number of hospital recorded episodes during the reference year for the sample person, including and excluding over-reports

Survey procedure and number of hospital recorded episodes	Including overreports			Excluding overreports		
	Interview reports	Hospital records	Percent underreported	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>						
Total-----	448	521	14	431	521	17
1 episode-----	354	410	14	339	410	17
2 episodes-----	78	90	13	76	90	16
3 episodes or more-----	16	21	24	16	21	24
<u>Procedure B</u>						
Total-----	526	558	6	510	558	9
1 episode-----	364	381	4	353	381	7
2 episodes-----	105	114	8	103	114	10
3 episodes or more-----	57	63	10	54	63	14
<u>Procedure C</u>						
Total-----	471	546	14	459	546	16
1 episode-----	350	401	13	342	401	15
2 episodes-----	92	102	10	90	102	12
3 episodes or more-----	29	43	33	27	43	37

Table 12. Percent of hospital episodes underreported, by survey procedure and relationship of respondent for the self-administered questionnaire to the respondent for the household interview, including and excluding overreports

Survey procedure and relationship of respondent for self-administered questionnaire to household interview respondent	Including overreports			Excluding overreports		
	Interview reports	Hospital records	Percent underreported	Interview reports	Hospital records	Percent underreported
<u>Procedure B</u>						
Total-----	526	558	6	510	558	9
Self-respondents, same respondent as in interview-----	113	116	3	109	116	6
Proxy-respondent, same respondent as in interview-----	118	122	3	115	122	6
Sample person, not interview respondent---	36	36	0	35	36	3
Neither sample person nor interview respondent-----	66	75	12	65	75	13
More than one person----	23	24	4	22	24	8
Unknown-----	170	185	8	164	185	11
<u>Procedure C</u>						
Total-----	471	546	14	459	546	16
Self-respondent; same respondent as in interview-----	136	152	11	134	152	12
Proxy-respondent, same respondent as in interview-----	159	180	12	156	180	13
Sample person, not interview respondent---	25	26	4	25	26	4
Neither sample person nor interview respondent-----	64	79	19	62	79	22
More than one person----	23	27	15	22	27	19
Unknown-----	64	82	22	60	82	27

Table 13. Percent of hospital episodes underreported, by survey procedure and sex of respondent, including and excluding overreports

Survey procedure and sex of respondent	Including overreports			Excluding overreports		
	Interview reports	Hospital records	Percent underreported	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>						
Total-----	448	521	14	431	521	17
Male-----	80	97	18	77	97	21
Female-----	360	415	13	346	415	17
Unknown-----	8	9	(*)	8	9	(*)
<u>Procedure B</u>						
Total-----	526	558	6	510	558	9
Male-----	86	94	9	82	94	13
Female-----	437	462	5	426	462	8
Unknown-----	3	2	(*)	2	2	(*)
<u>Procedure C</u>						
Total-----	471	546	14	459	546	16
Male-----	124	152	18	120	152	21
Female-----	289	321	10	285	321	11
Unknown-----	58	73	21	54	73	26

Table 14. Percent of hospital episodes underreported, by survey procedure and age of respondent, including and excluding overreports

Survey procedure and age of respondent	Including overreports			Excluding overreports		
	Interview reports	Hospital records	Percent underreported	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>						
Total-----	448	521	14	431	521	17
0-17 years-----	2	2	(*)	2	2	(*)
18-34 years-----	166	187	11	162	187	13
35-54 years-----	180	213	15	173	213	19
55 years or over-----	94	112	16	88	112	21
Unknown-----	6	7	(*)	6	7	(*)
<u>Procedure B</u>						
Total-----	526	558	6	510	558	9
0-17 years-----	3	3	(*)	3	3	(*)
18-34 years-----	181	197	8	178	197	10
35-54 years-----	238	254	6	233	254	8
55 years or over-----	101	101	0	94	101	7
Unknown-----	3	3	(*)	2	3	(*)
<u>Procedure C</u>						
Total-----	471	546	14	459	546	16
0-17 years-----	4	5	(*)	4	5	(*)
18-34 years-----	157	177	11	154	177	13
35-54 years-----	186	218	15	182	218	17
55 years or over-----	82	89	8	78	89	12
Unknown-----	42	57	26	41	57	28

Table 15. Percent of hospital episodes underreported, by survey procedure and education of respondent, including and excluding overreports

Survey procedure and education of respondent	Including overreports			Excluding overreports		
	Interview reports	Hospital records	Percent underreported	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>						
Total-----	448	521	14	431	521	17
0-8 years elementary school-----	105	129	19	97	129	25
1-3 years high school---	127	154	18	122	154	21
4 years high school-----	153	170	10	149	170	12
1 year college or more--	54	59	8	54	59	8
Unknown-----	9	9	(*)	9	9	(*)
<u>Procedure B</u>						
Total-----	526	558	6	510	558	9
0-8 years elementary school-----	153	159	4	145	159	9
1-3 years high school---	124	134	7	122	134	9
4 years high school-----	165	175	6	161	175	8
1 year college or more--	83	89	7	81	89	9
Unknown-----	1	1	(*)	1	1	(*)
<u>Procedure C</u>						
Total-----	471	546	14	459	546	16
0-8 years elementary school-----	88	98	10	84	98	14
1-3 years high school---	109	125	13	104	125	17
4 years high school-----	145	168	14	145	168	14
1 year college or more--	63	71	11	63	71	11
Unknown-----	64	81	21	61	81	25
Inappropriate-----	2	3	(*)	2	3	(*)

Table 16. Percent of hospital episodes underreported, by survey procedure and number of chronic or acute conditions reported for the sample person, including and excluding overreports

Survey procedure and number of chronic or acute conditions reported for sample person	Including overreports			Excluding overreports		
	Interview reports	Hospital records	Percent underreported	Interview reports	Hospital records	Percent underreported
<u>Procedure A</u>						
Total-----	448	521	14	431	521	17
None-----	98	129	24	97	129	25
1 or 2 conditions-----	205	236	13	199	236	16
3 conditions or more----	145	156	7	135	156	13
<u>Procedure B</u>						
Total-----	526	558	6	510	558	9
None-----	112	126	11	112	126	11
1 or 2 conditions-----	276	293	6	270	293	8
3 conditions or more----	138	139	1	128	139	8
<u>Procedure C</u>						
Total-----	471	546	14	459	546	16
None-----	112	148	24	111	148	25
1 or 2 conditions-----	222	253	12	216	253	15
3 conditions or more----	137	145	6	132	145	9

Table 17. Number and percent distribution of reported hospital episodes, by accuracy of reporting month of discharge and by survey procedure, excluding overreports

Accuracy of reporting month of discharge	Excluding overreports					
	Procedure A		Procedure B		Procedure C	
	Number	Percent	Number	Percent	Number	Percent
Total-----	431	100	510	100	459	100
Reported to have occurred before actual month of discharge*-----	41	9	76	15	35	8
Reported to have occurred after month of discharge-----	59	14	46	9	37	8
Reported in actual month of discharge----	331	77	386	76	380	83
Unknown-----	0	0	2	0	7	1

\*The month of admission was asked for in Procedure A. The month of discharge was then computed for this table

Table 18. Number and percent distribution of reported hospital episodes, by accuracy of reporting length of stay and by survey procedure, excluding overreports

Accuracy of reporting length of stay	Excluding overreports					
	Procedure A		Procedure B		Procedure C	
	Number	Percent	Number	Percent	Number	Percent
Total-----	431	100	510	100	459	100
More than actual days reported-----	138	32	152	30	138	30
Fewer than actual days reported-----	110	26	115	23	61	13
Exact number of days reported-----	181	42	241	47	259	57
Unknown-----	2	0	2	0	1	0



## APPENDIX I

### PART 1: SAMPLING ERRORS

The standard errors for the estimates in this report were calculated by use of the following equation: (The standard error is the square root of  $S_R^2$ ).

$$S_R^2 = \frac{m^2}{(m-1)X^2} (\sigma_{Y_1}^2 + R^2 \sigma_{X_1}^2 - 2R\sigma_{Y_1 X_1})$$

where,  $\sigma_{Y_1}^2 = \frac{1}{m} \sum_{i=1}^m (Y_i - \bar{Y})^2$ ;

$\sigma_{X_1}^2$  and  $\sigma_{Y_1 X_1}$  are defined similarly.

$m$  = number of interviews for a given procedure.

$Y_i$  = number of episodes not reported for sample persons in households interviewed by the  $i^{\text{th}}$  interviewer.

$X_i$  = total number of hospital episodes, based on hospital records, for all sample persons in households interviewed by the  $i^{\text{th}}$  interviewer.

$X = \sum X_i$  = total number of hospital episodes, based on hospital records, for all sample persons in a survey procedure.

$R = \frac{\sum Y_i}{\sum X_i}$  = hospitalization underreporting rate.

As may be seen, this formula treats the interviewers for a procedure as clusters. From the underreporting rates for the 10 clusters for Procedure A or Procedure B and 20 for Procedure C, the variance of estimates of underreporting may be generated, either for the total sample or for subgroups within the sample.

The estimate of the variance follows the standard procedure for cluster sampling. (e.g., W.G. Cochran;

*Sampling Techniques*, New York: Wiley, 1953, p. 119.) This model was used on the advice of Dr. Leslie Kish, as a practical, useful approximation that fitted well enough, though not completely, the actual design which was somewhat more complicated. Dr. Kish supervised the computations and the construction and use of the tables of the sampling errors.

For purposes of comparing Procedures A and B, since the interviewers were different and yet randomly assigned to procedures, it was possible to assume that the report rates in the two procedures were independent. In comparing Procedures A and C, however, since half of the interviewers in Procedure C were also the interviewers for Procedure A, it was necessary to compute the covariance between Procedures A and C for estimating the variance of differences.

Table I shows standard errors for selected characteristics of the sample as well as standard errors of differences between percentages for Procedures A and B, and between Procedures B and C. The Procedure B estimates include the results of the mail follow-up form.

In general, and as demonstrated in table I, the standard error of one statistic is different from that of another statistic, even when the two come from the same survey. Since it was not feasible to compute standard errors for each of the many statistics in the report, ratios of the standard errors shown in table I to the standard errors of binomial variates, assuming simple random sampling, were computed. The ratios ranged from a low of about 0.7 to a high of about 2.2. The median value was 1.4. Rough estimates of standard errors of percentages shown in this report, which should be sufficiently accurate for most purposes, may be obtained by the equation  $\sigma_R^2 = 1.4 PQ/n$ , where  $P$  is the proportion of hospital episodes underreported,  $Q$  is the proportion reported, and  $n$  is the number of episodes in the sample.

If a more conservative estimate of the variance is desired, use the upper limit of the ratio instead of the median as the constant multiplier.

Table I. Standard errors of underreporting percentages shown in this report and standard errors of differences between Procedures A and B and between Procedures A and C, for selected characteristics of the sample

Characteristic of sample	Standard errors of underreporting percentages X 10 <sup>-2</sup>			Standard errors of differences X 10 <sup>-2</sup>	
	Procedure A	Procedure B	Procedure C	$\sigma(A-B)$	$\sigma(A-C)$
Total-----	2.0	1.5	1.7	2.5	1.0
<u>Income</u>					
Under \$7,000-----	3.0	1.3	2.2	3.3	4.1
\$7,000+-----	2.1	1.5	2.3	2.5	2.9
<u>Type of respondent</u>					
Self-----	1.9	1.4	2.5	2.4	2.5
Proxy-----	3.0	2.0	2.3	3.6	2.6
<u>Race</u>					
White-----	2.0	1.6	1.9	2.5	2.0
Nonwhite-----	7.4	4.3	5.7	8.6	7.9
<u>Age</u>					
Under 17-----	4.0	1.9	3.4	4.4	5.2
18-54-----	2.1	2.1	2.0	3.0	2.9
55+-----	4.6	1.9	4.2	5.0	4.5
<u>Sex</u>					
Male-----	2.8	1.4	3.4	3.1	4.5
Female-----	2.4	2.5	1.9	3.5	1.8
<u>Threat rating</u>					
Most threatening-----	4.3	4.1	5.2	5.9	9.4
Somewhat threatening-----	5.5	2.0	4.1	5.9	7.5
Not threatening-----	2.3	1.7	2.5	2.9	3.3
<u>Time interval between discharge and interview</u>					
Under 30 weeks-----	1.4	0.9	1.9	1.7	1.8
31-53 weeks-----	3.5	2.9	2.5	4.5	4.3
<u>Type of treatment</u>					
Surgical-----	2.0	1.4	1.7	2.4	2.3
Nonsurgical-----	3.6	2.5	2.8	4.4	3.4

## PART 2: ANALYSIS OF INTERVIEW ASSIGNMENTS

The initial sample was composed of 600, 598, and 597 persons for Procedures A, B, and C, respectively. However, the data shown in this report is based on 462 persons for Procedure A, 456 for Procedure B, and 465 for Procedure C. The difference between the two sets of figures is due to nonresponse and deletions from the sample. Table II shows the results of the interview assignments, and lists the reasons for nonresponse and

edit deletions. The deletions should not be considered part of the sample as they would not have been included in the initial sample if they could have been detected.

The major reason for nonresponse was that the assigned family could not be located. Follow-up of families who had moved outside of the Detroit urbanized area was not attempted.

Table II. Disposition of interview assignments, by survey procedure

Disposition of interview assignment	Survey procedure		
	A	B	C
Number of interviews assigned-----	600	598	597
Number of interviews completed-----	516	492	500
Number of interviews not completed-----	84	106	97
Refusal-----	8	9	8
Not at home-----	15	22	32
Family not located-----	59	71	53
Other-----	2	4	4
Number deleted during editing-----	54	36	35
Sample person not listed in interview-----	32	28	26
No hospitalizations for sample person			
during reference year-----	20	7	6
Other-----	2	1	3
Total number of persons included in the analysis-----	462	456	465

## FORMS AND QUESTIONNAIRES USED IN THE STUDY

USCQMM DC 13729 P 61

## PROCEDURE A QUESTIONNAIRE

The items below show the exact content and wording of the basic questionnaire used in the nationwide household survey of the U. S. National Health Survey. The actual questionnaire is designed for a household as a unit and includes additional spaces for reports on more than one person, condition, accident or hospitalization. Such repetitive spaces are omitted in this illustration.

The National Health Survey is authorized by Public Law 652 of the 84th Congress (70 Stat. 489, 42 U. S. C. 305). All information which would permit identification of the individual will be held strictly confidential, will be used only by persons engaged in and for the purposes of the survey, and will not be disclosed or released to others for any other purposes (22 FR 1687).

FORM NHS 5-14 A  
(12-23-61)

U. S. DEPARTMENT OF COMMERCE  
BUREAU OF THE CENSUS  
ACTING AS COLLECTING AGENT FOR THE  
U. S. PUBLIC HEALTH SERVICE

### NATIONAL HEALTH SURVEY

1. Questionnaire

of \_\_\_\_\_

Questionnaires

2. (a) Address or description of location	3. Ident. Code <b>A</b>	3. (a) Reg. office Code	4. Sub-sample weight	5. Sample	6. PSU No.	7. Segment No.	8. Serial No.
---	----------------------------	-------------------------	----------------------	-----------	------------	----------------	---------------

(b) Mailing address if not shown in (a)	(c) Type of living quarters <input type="checkbox"/> Housing unit <input type="checkbox"/> Other	(d) Name of special dwelling place, Code
---	--	--

<p>9. Are there any other living quarters, occupied or vacant, in this building (apartment)? ... <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>10. Does anyone else living in this building use YOUR ENTRANCE to get to his living quarters? ... <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>11. Is there any other building on this property for people to live in, either occupied or vacant? ... <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><small>Ask at all units except apartment houses.</small></p>	<p style="text-align: center;"><b>INSTRUCTIONS FOR Q. 9, 10 AND 11</b></p> <p>If "Yes," to questions 9, 10 or 11 apply definition of a housing unit to determine whether one or more additional questionnaires should be filled.</p> <p>12. What is the telephone number here? <input type="checkbox"/> No telephone</p> <p>13. In case I've overlooked anything, what is the best time to call?</p>
--	--

14. RECORD OF CALLS AT HOUSEHOLDS											
Item		1	Com.	2	Com.	3	Com.	4	Com.	5	Com.
Entire household		Date Time									
Callbacks for individual respondents	Col. No. _____	Date Time									
	Col. No. _____	Date Time									
	Col. No. _____	Date Time									
	Col. No. _____	Date Time									
	Col. No. _____	Date Time									

15. REASON FOR NON-INTERVIEW		
TYPE	A	B
Reason	<input type="checkbox"/> Refusal (Fill item 16) <input type="checkbox"/> No one at home - repeated calls <input type="checkbox"/> Temporarily absent <input type="checkbox"/> Other (Specify) _____	<input type="checkbox"/> Vacant - non-seasonal <input type="checkbox"/> Vacant - seasonal <input type="checkbox"/> Usual residence elsewhere <input type="checkbox"/> Armed Forces <input type="checkbox"/> Other (Specify) _____
	<p><small>Fill item 17</small></p>	<p>Interview not obtained for:</p> <p>Cols. _____</p> <p>because: _____</p>

16. Reason for refusal \_\_\_\_\_

17. TYPE "A" FOLLOW-UP PROCEDURE	
<p>If final call results in a Type A non-interview (except Refusals) take the following steps:</p> <p>1. Contact neighbors (caretakers, etc.) until you find someone who knows the family.</p> <p>2. Find out the number of people in the household, their names and approximate ages, if names of all members not known, ascertain relationships. Record this information ... in the regular spaces inside the questionnaire.</p> <p>3. Find out if anyone in the housing unit is now in a hospital as a patient, if so, which person it is. This is done by asking the following questions:</p> <p>4. Is anyone in the household now in the hospital? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/> No contact made</p> <p>(a) If "Yes," -- What? (Enter name) _____ (Col. No.) _____</p>	
18. Signature of Interviewer _____	19. Code _____

1. (a) What is the name of the head of the household? (Enter name in first column) (b) What are the names of all other persons who live here? (List all persons who live here) (c) Do any (other) lodgers or roomers live here? <input type="checkbox"/> No <input type="checkbox"/> Yes (List) _____ (d) Is there anyone else who lives here who is now temporarily in a hospital? <input type="checkbox"/> No <input type="checkbox"/> Yes (List) _____ (e) Away on business? <input type="checkbox"/> No <input type="checkbox"/> Yes (List) _____ (f) On a visit? <input type="checkbox"/> No <input type="checkbox"/> Yes (List) _____ (g) Is there anyone else staying here now? <input type="checkbox"/> No <input type="checkbox"/> Yes (List) _____		Last name (L)   First name and initial
(h) Do any of the people in this household have a home elsewhere? <input type="checkbox"/> No (leave on questionnaire) <input type="checkbox"/> Yes (apply household membership rules; if not a household member, delete)		
2. How are you related to the head of the household? (Enter relationship to head, for example head, wife, daughter, grandson, mother-in-law, partner, lodger, lodger's wife, etc.)		Relationship Head
3. How old were you on your last birthday?		Age _____ <input type="checkbox"/> Under 1 year
4. Race (Check one box for each person)		<input type="checkbox"/> White <input type="checkbox"/> Negro <input type="checkbox"/> Other
5. Sex (Check one box for each person)		<input type="checkbox"/> Male <input type="checkbox"/> Female
If 17 years old or over, ask. 6. Are you now married, widowed, divorced, separated or never married? (Check one box for each person)		<input type="checkbox"/> Married <input type="checkbox"/> Divorced <input type="checkbox"/> Widowed <input type="checkbox"/> Separated <input type="checkbox"/> Never married
If 17 years old or over, ask. 7. (a) What were you doing most of the past 12 months -- (For males) working, or doing something else? (For females) working, keeping house, or doing something else? If "Something else" checked, and person is 45 years old or over, ask: (b) Are you retired?		<input type="checkbox"/> Under 17 years <input type="checkbox"/> Working <input type="checkbox"/> Keeping house <input type="checkbox"/> Something else <input type="checkbox"/> Yes <input type="checkbox"/> No
NOTE: Determine which adults are at home and record this information. Beginning with question 8 you are to interview for himself or herself, each adult person who is at home.		<input type="checkbox"/> Under 17 years <input type="checkbox"/> At home <input type="checkbox"/> Not at home
8. Were you sick at any time LAST WEEK OR THE WEEK BEFORE? (That is, the 2-week period which ended last Sunday?) (a) What was the matter? (b) Anything else?		<input type="checkbox"/> Yes <input type="checkbox"/> No
9. Last week or the week before did you take any medicine or treatment for any condition (besides . . . which you told me about)? (a) For what conditions? (b) Anything else?		<input type="checkbox"/> Yes <input type="checkbox"/> No
10. Last week or the week before did you have any accident or injuries? (a) What were they? (b) Anything else?		<input type="checkbox"/> Yes <input type="checkbox"/> No
11. Did you ever have an (any other) accident or injury that was still bothering you last week or the week before? (a) In what way did it bother you? (b) Anything else?		<input type="checkbox"/> Yes <input type="checkbox"/> No
12. AT THE PRESENT TIME do you have any ailments or conditions that have lasted for a long time? (If "No") Even though they don't bother you all the time? (a) What are they? (b) Anything else?		<input type="checkbox"/> Yes <input type="checkbox"/> No
13. Has anyone in the family - you, your -, etc. - had any of these conditions DURING THE PAST 12 MONTHS? (Read Card A, condition by condition) record any conditions mentioned in the column for the person)		<input type="checkbox"/> Yes <input type="checkbox"/> No
14. Does anyone in the family have any of these conditions? (Read Card B, condition by condition, record any conditions mentioned in the column for the person)		<input type="checkbox"/> Yes <input type="checkbox"/> No
15. (a) Have you been in a hospital at any time DURING THE PAST 12 MONTHS? If "Yes," (b) How many times were you in the hospital overnight or longer?		<input type="checkbox"/> Yes <input type="checkbox"/> No _____ No. of times
16. If baby under one year listed as a household member, ask: (a) Was the baby born in a hospital or at home? If "hospital" in q. 16 and 1 or more in q. 15 ask: (b) Was this hospitalization included in the number you just gave me?		<input type="checkbox"/> Hospital <input type="checkbox"/> Home <input type="checkbox"/> Yes <input type="checkbox"/> No (Check proper boxes for both mother and child.)
17. (a) During the past 12 months has anyone in the family been a patient in a nursing home or sanitarium? If "Yes," ask: (b) Who was this? (c) How many times were you in a nursing home or sanitarium?		<input type="checkbox"/> Yes <input type="checkbox"/> No _____ No. of times
R (for q. 8-17)	For persons 17 years old or over, show who responded for (or was present during the asking of) q. 8-17. If person responded for self, show whether entirely or partly. For persons under 17 show who responded for them	<input type="checkbox"/> Responded for self-entirely Col. _____ Resp., this person <input type="checkbox"/> Present and reported <input type="checkbox"/> Present - did not report <input type="checkbox"/> Not present (or child)

Table I - ILLNESSES, IMPAIRMENTS AND INJURIES								
Line number	Col. No. of person	Question number	Did you EVER at any time talk to a doctor about ... ?	Ask for all illnesses and present effects of old injuries: (a) If doctor talked to: What did the doctor say it was? ... did he give it a medical name? (b) If doctor not talked to: Record original entry and ask (d-2) - (d-5) as required Ask for all injuries during past 2 weeks: What part of the body was hurt? What kind of injury was it? Anything else? (Also, fill Table A for all injuries)	Ask if the entry in Col. (d-1) is: An impairment, or a Symptom, or came from question 11 or 14: What was the cause of ... ? (If "Cause" is an injury, also fill Table A)	Ask only if: 6 years old or over and blindness, poor vision, or eye trouble of any kind. Can you see well enough to read ordinary newspaper print with glasses?	Ask for any entry in Col. (d-1) or Col. (d-2) that includes the words: Allergy* Tumor Asthma "Condition" Cyst "Disease" Growth "Trouble" Stroke What kind of ... is it? *For an allergy or stroke ask. How does the allergy (stroke) affect you?	Ask only for Impairments and injuries And for: Abscesses Inflammation Aches Neuralgia Bleeding Neuritis Blood Clot Pains Boils Sores Cancer Soreness Cyst Tumor Growth Ulcers Infection Weakness What part of the body is affected? Show detail for: Ear or eye - (one or both) Head - (Skull, scalp, face) Back - (Upper, middle, lower) Arm - (Shoulder, upper, elbow, lower, wrist, hand; one or both) Leg - (Hip, upper, knee, lower ankle, foot; one or both)
(a)	(b)	(c)	(d-1)	(d-2)	(d-3)	(d-4)	(d-5)	
1		<input type="checkbox"/> Yes <input type="checkbox"/> No			<input type="checkbox"/> Yes <input type="checkbox"/> No			
2		<input type="checkbox"/> Yes <input type="checkbox"/> No			<input type="checkbox"/> Yes <input type="checkbox"/> No			

Table II - HOSPITALIZATION DURING PAST 12 MONTHS									
Line number	Col. No. of person	Question No.	When did you enter the hospital? (Month, year)	How many nights were you in the hospital?	To Interviewer				What did they say at the hospital the condition was -- did they give it a medical name? (If "they" didn't say, ask): What did the last doctor you talked to say it was? (Entry must show "Cause," "Kind," and "Part of Body" in same detail as required in Table I)
					How many of these -- nights were in the past 12 months?	Will you need to ask Col. (f) and (g)?	How many of these -- nights were last week or the week before?	Was this person still in the hospital on last Sunday night?	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
1		Mo. _____ Yr. _____	_____ Nights	<input type="checkbox"/> All or <input type="checkbox"/> Nights	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No			
2		Mo. _____ Yr. _____	_____ Nights	<input type="checkbox"/> All or <input type="checkbox"/> Nights	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No			

18. (a) I have some questions about health insurance. We don't want to include insurance that pays ONLY for accidents, but we are interested in all other kinds... Do you, your-- have insurance that pays all or part of the bills when you go to the hospital? If "Yes," (b) What is the name of the plan (or plans)? Any other plans? (c) Who is covered by this plan (each plan)? (Check "Yes," in 18(a) for each person covered)	<input type="checkbox"/> Yes <input type="checkbox"/> No Name of plan(s)
19. (a) Excluding insurance that pays ONLY for accidents, do you, your-- have insurance that pays all or part of the surgeon's bill for an operation? If "Yes," (b) What is the name of the plan (or plans)? Any other plans? (c) Who is covered by this plan (each plan)? (Check "Yes," in 19(a) for each person covered)	<input type="checkbox"/> Yes <input type="checkbox"/> No Name of plan(s)
20. (a) Do you, your-- , etc. have insurance that pays any part of doctors' bills for home calls and office visits? If "Yes," (b) Does it pay for home calls and office visits for most kinds of sickness? If "Yes," (c) What is the name of the plan? (d) Who is covered by this plan?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No Name of plan(s)
If 17 years old or over, ask: 21. (a) What is the highest grade you attended in school? (Circle highest grade attended or check "None") (b) Did you finish the-- grade (year)?	<input type="checkbox"/> Under 17 years Elem: 1 2 3 4 5 6 7 8 High: 1 2 3 4 College: 1 2 3 4 5+ <input type="checkbox"/> None <input type="checkbox"/> Yes <input type="checkbox"/> No

Table I - ILLNESSES, IMPAIRMENTS AND INJURIES														
LAST WEEK OR THE WEEK BEFORE did ... cause you to cut down on your usual activities for as much as a day?	How many days, including the Saturday, Sunday and Sun days?	How many of these -- days were you in bed all or most of the day?	If 6 - 16 years old ask  How many days did ... keep you from school last week or the week before?	If 17 years old or over ask  LAST WEEK or the WEEK BEFORE, how many days did ... keep you from work? (For females add) not counting work around the house?	Did you first notice ... (did it happen) during the past 3 months OR before that time?		To Interviewer.  CONTINUE if (k) is checked, or the condition is on Card A or is an impairment, other wise, STOP	About how many days during the past 12 months, has ... kept you in bed for all or most of the day?	If 1 or more days in Col (n) and Col (e) is checked, ask  How many of these days were ... during last week or the week before?	Ask after completing last condition for each person			Line number	
					Check one Before 3 mos. (Go to Col. (n))	During 3 mos. (If during past 2 weeks, ask)  Which week, last week or the week before?				Please look at this card and read each statement. Then tell me which statement fits you best, in terms of health. (Show Cards C-F, as appropriate)	If "1," "2," or "3" in Col (p)	If "Yes" in Col (q)		Which?
(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	
		Days or None	Days or None	Days or None				Days or None	Days or None		Yes or No		1	
		Days or None	Days or None	Days or None				Days or None	Days or None		Yes or No		2	

Table II - HOSPITALIZATION DURING PAST 12 MONTHS			Line number
Were any operations performed on you during this stay at the hospital?  If "Yes," (a) What was the name of the operation? (b) Any other operations?	What is the name and address of the hospital you were in?  (Enter name, city and State, if city not known, enter county)	To Interviewer Carry this condition through Table I, if it does not appear there and 1 or more nights in Col. (f), or condition is on Card A, or is an impairment  Will you need to fill Table I?	
(i)	(j)	(xx)	
<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	1
<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	2

22. If Male and 17 years old or over, ask: (a) Did you ever serve in the Armed Forces of the United States? If "Yes," ask: (b) Are you now in the Armed Forces, not counting the reserves? (If "Yes," delete this person from questionnaire) → (c) Was any of your service during a war or was it peace time only? If "War," ask: (d) During which war did you serve? If "Peace-time" only, ask: (e) Was any of your service between June 27, 1950 and January 31, 1955?	<input type="checkbox"/> Fem or und 17 yrs <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> War <input type="checkbox"/> Peace-time only <input type="checkbox"/> WW II <input type="checkbox"/> Korean <input type="checkbox"/> Other <input type="checkbox"/> Yes <input type="checkbox"/> No
23. Ask for all persons 17 years old or over: (a) Did you work at any time last week or the week before? If "No," ask 23(b) and (c). (b) Even though you did not work last week or the week before do you have a job or business? (c) Were you looking for work or on layoff from a job?	<input type="checkbox"/> Yes <input type="checkbox"/> Under 17 years <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No
If "Yes" in Question 23(a), (b), or (c), ask: 24. (a) For whom did you work? (b) What kind of business or industry was this? (c) What kind of work were you doing? (d) Class of worker (fill from information above; or, if not clear, ask): Ask only for persons 20 years old or over: (e) Have you been a --, or doing this kind of work for the past three years?	Name of employer: Industry: Occupation: <input type="checkbox"/> Private-paid <input type="checkbox"/> Gov't <input type="checkbox"/> Own <input type="checkbox"/> Non-paid <input type="checkbox"/> Yes <input type="checkbox"/> Under 20 years <input type="checkbox"/> No
25. Which of these income groups represents your total family income for the past 12 months, that is, your's, your's --'s etc? (Show Card H). Include income from all sources, such as wages, salaries, rents from property, pensions, help from relatives, etc.	Group No



Table A - (Accidents and Injuries)			
Line No. from Table I	1. When did the accident happen?	2. At the time of the accident, what part of the body was hurt? What kind of injury was it? Anything else?	
	Year	Part(s) of body	Kind of injury(s)
Accident happened last week or week before (Go to q. 3) <input type="checkbox"/>	(If 1960 or 1961 also enter month) Month		
3. (a) Was a car, truck, bus or other motor vehicle involved in the accident in any way? <input type="checkbox"/> Yes <input type="checkbox"/> No (b) Was more than one motor vehicle involved? <input type="checkbox"/> Yes (more than one) <input type="checkbox"/> No (c) Was it (either one) moving at the time? <input type="checkbox"/> Yes <input type="checkbox"/> No			
4. (a) Where did the accident happen -- at home or some other place? 1. <input type="checkbox"/> At home (inside house)      2. <input type="checkbox"/> At home (adjacent premises) <input type="checkbox"/> Some other place (If "Some other place," ask: (b) What kind of place was it? 3. <input type="checkbox"/> Street and highway (includes roadway)      6. <input type="checkbox"/> School (includes school premises) 4. <input type="checkbox"/> Farm      7. <input type="checkbox"/> Place of recreation and sports, except at school 5. <input type="checkbox"/> Industrial place (includes premises)      8. <input type="checkbox"/> Other (Specify the place where accident happened) _____			
5. Were you at work at your job or business when the accident happened? 1. <input type="checkbox"/> Yes      2. <input type="checkbox"/> No      3. <input type="checkbox"/> While in Armed Services      4. <input type="checkbox"/> Under 17 at time of accident			
Table A - (Accidents and Injuries)			
Line No. from Table I	1. When did the accident happen?	2. At the time of the accident, what part of the body was hurt? What kind of injury was it? Anything else?	
	Year	Part(s) of body	Kind of injury(s)
Accident happened last week or week before (Go to q. 3) <input type="checkbox"/>	(If 1960 or 1961 also enter month): Month		
3. (a) Was a car, truck, bus or other motor vehicle involved in the accident in any way? <input type="checkbox"/> Yes <input type="checkbox"/> No (b) Was more than one motor vehicle involved? <input type="checkbox"/> Yes (more than one) <input type="checkbox"/> No (c) Was it (either one) moving at the time? <input type="checkbox"/> Yes <input type="checkbox"/> No			
4. (a) Where did the accident happen -- at home or some other place? 1. <input type="checkbox"/> At home (inside house)      2. <input type="checkbox"/> At home (adjacent premises) <input type="checkbox"/> Some other place If "Some other place," ask: (b) What kind of place was it? 3. <input type="checkbox"/> Street and highway (includes roadway)      6. <input type="checkbox"/> School (includes school premises) 4. <input type="checkbox"/> Farm      7. <input type="checkbox"/> Place of recreation and sports, except at school 5. <input type="checkbox"/> Industrial place (includes premises)      8. <input type="checkbox"/> Other (Specify the place where accident happened) _____			
5. Were you at work at your job or business when the accident happened? 1. <input type="checkbox"/> Yes      2. <input type="checkbox"/> No      3. <input type="checkbox"/> While in Armed Services      4. <input type="checkbox"/> Under 17 at time of accident			
FOOTNOTES AND COMMENTS			

## PROCEDURE B QUESTIONNAIRES

- a. The household interview questionnaire. — This questionnaire was identical to that for Procedure A except for the section on hospitalization.

<p>15 The PHS needs to find out about how much people use hospitals in order to plan health facilities and programs</p> <p>(a) Have you, yourself, been in a hospital at any time during 1960 or 1961? (If "Yes")</p> <p>(b) How many times were you in the hospital overnight or longer?</p> <p>(c) Did you have any other overnight hospital stays during 1960 or 1961 besides, which you told me about?</p> <p>(d) How many times was this? (Do not change answer in Question 15(b))</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>_____ No. of times</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>_____ No. of times</p>
<p>16. Ask ONLY AFTER Question 15 has been recorded for each related member of household:</p> <p>(a) Since it is important to get an accurate picture of hospital stays, just let me check -- Can you think of any (other) overnight stays in 1960 or 1961 for yourself or any member of your family (living in this household) even though they were short or happened some time ago?</p> <p>(b) (If "Yes") How many times was this? (Do not change answers in Question 15)</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>_____ No. of times</p>

Table II - HOSPITALIZATION DURING PAST 12 MONTHS					
Line number	Col No of person	Question No	How many nights were you in the hospital?	Give calendar to respondent. What month and year did you LEAVE the hospital? (month, year)	What did they say at the hospital the condition was -- did they give it a medical name? (If "they" didn't say, ask): What did the last doctor you talked to say it was? (Entry must show "Cause", "Kind", and "Part of Body" in same detail as required in Table I)
	(a)	(b)	(c)	(d)	(e)
1			Mo. _____ Yr. _____ Nights _____	<input type="checkbox"/> Still in hospital	
2			Mo. _____ Yr. _____ Nights _____	<input type="checkbox"/> Still in hospital	
3			Mo. _____ Yr. _____ Nights _____	<input type="checkbox"/> Still in hospital	

Table II - HOSPITALIZATION DURING PAST 12 MONTHS			
Were any operations performed on you during this stay at the hospital? If "Yes," (a) What was the name of the operation? (b) Any other operations?	What is the name and address of the hospital you were in?  (Enter name, city and state, if city not known, enter county)	To interviewer Carry this condition through Table I, if it does not appear there and still in hospital in Col (d) or condition is on Card A, or is an impairment. Will you need to fill Table I?	Line number
(f)	(g)	(xx)	
<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	1
<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	2
<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	3

- b. The mail follow-up questionnaire.—Two different forms were used, depending on whether or not hospital episodes were reported in the interview. The covering letter which was on the front of the questionnaire, was similar for both forms.

Questionnaire for households reporting hospitalizations

FORM NHS 5 14-B 2  
(3 23 61)

Budget Bureau No. 68-6109  
Approval Expires September 1, 1961

U. S. DEPARTMENT OF COMMERCE  
BUREAU OF THE CENSUS  
REGIONAL OFFICE  
673 FEDERAL BUILDING  
DETROIT 26, MICHIGAN

TEL. WO. 3 9330  
EXT. 214

In connection with the National Health Survey which the Bureau of the Census conducts for the U. S. Public Health Service, one of our interviewers called at your home recently. Your cooperation in answering these health questions was a definite public service.

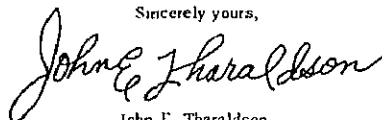
In order to be sure the information collected is as complete as possible, it is necessary that the Census Bureau check on its work. For this reason we are requesting that you answer the questions on the inside of this form about hospital stays you and your family may have had during 1960 and 1961. Mailing the form to your home will give an opportunity for all family members to take part in answering the questions.

Please mail the form back to us within five days. A self-addressed envelope which requires no postage has been provided for your convenience.

The information will be given confidential treatment by the Bureau of the Census and the U. S. Public Health Service. Nothing will be published except statistical summaries.

Thank you.

Sincerely yours,



John F. Tharaldson  
Regional Field Director

CONFIDENTIAL - This information is collected for the U. S. Public Health Service under authority of Public Law 652 of the 84th Congress (70 Stat 489, 42 U. S. C. 305). All information which would permit identification of the individual will be held strictly confidential, will be used only by persons engaged in and for the purposes of the survey and will not be disclosed or released to others for any other purposes (22 FR 1687).

USCMM-DC 14153 P-1

PLEASE FILL OUT SECTIONS A AND B ON PAGE 2 AND SECTION D ON PAGE 4 IN ALL CASES. FILL SECTION C ON PAGE 3 AS REQUIRED.

Section A		Section B																																													
<p>1. The information from the National Health Survey interview at your household indicated that the following persons were not in the hospital during 1960 or 1961 --</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Name</th> <th style="width: 50%;">Relationship</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table>		Name	Relationship																					<p>4. The information from the National Health Survey interview at your household indicated that the following persons were in the hospital during 1960 or 1961 --</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Name</th> <th style="width: 50%;">Relationship</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table>		Name	Relationship																				
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Name	Relationship																																														
<p>2. Can you think of any time any one of the persons shown in Section A was in the hospital overnight or longer during 1960 or 1961 --</p> <p>Check "Yes" or "No" to each part</p> <p>a. For an operation?  <input type="checkbox"/> Yes      <input type="checkbox"/> No</p> <p>b. To have a baby or because of a miscarriage?          (Also count trips to hospital for false labor)  <input type="checkbox"/> Yes      <input type="checkbox"/> No</p> <p>c. For treatment of an illness?  <input type="checkbox"/> Yes      <input type="checkbox"/> No</p> <p>d. Because of an accident or injury?  <input type="checkbox"/> Yes      <input type="checkbox"/> No</p> <p>e. For tests or observation?  <input type="checkbox"/> Yes      <input type="checkbox"/> No</p> <p>f. For any other reason even if nothing was seriously wrong?  <input type="checkbox"/> Yes      <input type="checkbox"/> No</p> <p>Be sure to count stays in the hospital even if the bill has not yet been paid or was paid by someone else.</p>		<p>5. Please look at the blue sheet which contains information from the earlier interview about each of the hospital stays for the persons shown in Section B</p> <p>Can you think of any OTHER time any one of the persons shown in Section B was in the hospital overnight or longer during 1960 or 1961 --</p> <p>Check "Yes" or "No" to each part</p> <p>a. For a short stay?  <input type="checkbox"/> Yes      <input type="checkbox"/> No</p> <p>b. For a minor ailment?  <input type="checkbox"/> Yes      <input type="checkbox"/> No</p> <p>c. For any other reason at all?  <input type="checkbox"/> Yes      <input type="checkbox"/> No</p>																																													
<p>3. Altogether how many times were these persons in the hospital overnight or longer during 1960 and 1961 --</p> <p>_____ No. of times in hospital      or      <input type="checkbox"/> None</p>		<p>If you have checked "Yes" to any part of question 5a through 5c, complete one column of Section C for each time each person shown in Section B was in the hospital during 1960 or 1961, besides the hospital stays shown on the enclosed sheet</p>																																													
<p>If you have checked "Yes" to any part of question 2a through 2f, complete one column of Section C for each time each person shown in Section A was in the hospital during 1960 or 1961.</p>																																															

SECTION C		
IF THERE ARE MORE THAN 2 HOSPITAL STAYS TO BE REPORTED, CONTINUE ON THE BACK OF THIS FORM. IF THERE ARE MORE THAN 3 HOSPITAL STAYS, USE AN EXTRA SHEET OF PAPER TO DESCRIBE THE ADDITIONAL STAYS.		
	Hospital Stay # 1	Hospital Stay # 2
a Write in the name of the person who was in the hospital →	Name of person in hospital	Name of person in hospital
b How many nights was this person in the hospital during this hospital stay?	_____ No. of nights in hospital	_____ No. of nights in hospital
c When did this person LEAVE the hospital? (Check 1960 or 1961 and also enter the month)	<input type="checkbox"/> 1961 <input type="checkbox"/> 1960 (month left hospital) or <input type="checkbox"/> Still in hospital	<input type="checkbox"/> 1961 <input type="checkbox"/> 1960 (month left hospital) or <input type="checkbox"/> Still in hospital
d What was the reason for this stay in the hospital?  Check as many reasons as apply for this stay in the hospital.  If the reason for the hospital stay was an illness or an injury, also show the illness or injury in the box provided for that purpose.	<input type="checkbox"/> For tests or observation <input type="checkbox"/> To have a baby or for a miscarriage (Count false labor here) <input type="checkbox"/> For treatment of an illness What was the illness? <input type="checkbox"/> For treatment of an accident or an injury What was the injury? <input type="checkbox"/> For other reason(s) (If the reason was to have an operation, count that here) What was the reason?	<input type="checkbox"/> For tests or observation <input type="checkbox"/> To have a baby or for a miscarriage (Count false labor here) <input type="checkbox"/> For treatment of an illness What was the illness? <input type="checkbox"/> For treatment of an accident or an injury What was the injury? <input type="checkbox"/> For other reason(s) (If the reason was to have an operation, count that here) What was the reason?
e Were any operations performed on this person during this stay at the hospital?	<input type="checkbox"/> Yes <input type="checkbox"/> No What was the operation(s)?	<input type="checkbox"/> Yes <input type="checkbox"/> No What was the operation(s)?
f What was the name and address of the hospital this person was in during this particular stay?  Show city and state, the street address is not necessary.	Name of hospital  City  State	Name of hospital  City  State

Section C is continued on the back of this form

PAGE 3

USCOMM DC 14183 P-61

SECTION C - Continued		
	Hospital Stay # 3	Hospital Stay # 4
a. Write in the name of the person who was in the hospital →	Name of person in hospital	Name of person in hospital
b. How many nights was this person in the hospital during this hospital stay?	_____ No. of nights in hospital	_____ No. of nights in hospital
c. When did this person LEAVE the hospital? Check 1960 or 1961 and also enter the month	<input type="checkbox"/> 1961 <input type="checkbox"/> 1960 (month left hospital) or <input type="checkbox"/> Still in hospital	<input type="checkbox"/> 1961 <input type="checkbox"/> 1960 (month left hospital) or <input type="checkbox"/> Still in hospital
d. What was the reason for this stay in the hospital?  Check as many reasons as apply for this stay in the hospital  If the reason for the hospital stay was an illness or an injury, also show the illness or injury in the box provided for that purpose.	<input type="checkbox"/> For tests or observation <input type="checkbox"/> To have a baby or for a miscarriage (Count false labor here) <input type="checkbox"/> For treatment of an illness <div style="border: 1px solid black; padding: 5px; margin: 5px;">What was the illness?</div> <input type="checkbox"/> For treatment of an accident or an injury <div style="border: 1px solid black; padding: 5px; margin: 5px;">What was the injury?</div> <input type="checkbox"/> For other reason(s) (If the reason was to have an operation, count that here) <div style="border: 1px solid black; padding: 5px; margin: 5px;">What was the reason?</div>	<input type="checkbox"/> For tests or observation <input type="checkbox"/> To have a baby or for a miscarriage (Count false labor here) <input type="checkbox"/> For treatment of an illness <div style="border: 1px solid black; padding: 5px; margin: 5px;">What was the illness?</div> <input type="checkbox"/> For treatment of an accident or an injury <div style="border: 1px solid black; padding: 5px; margin: 5px;">What was the injury?</div> <input type="checkbox"/> For other reason(s) (If the reason was to have an operation, count that here) <div style="border: 1px solid black; padding: 5px; margin: 5px;">What was the reason?</div>
e. Were any operations performed on this person during this stay at the hospital?	<input type="checkbox"/> Yes <input type="checkbox"/> No <div style="border: 1px solid black; padding: 5px; margin: 5px;">What was the operation(s)?</div>	<input type="checkbox"/> Yes <input type="checkbox"/> No <div style="border: 1px solid black; padding: 5px; margin: 5px;">What was the operation(s)?</div>
f. What was the name and address of the hospital this person was in during this particular stay?  Show city and state; the street address is not necessary.	Name of hospital  City  State	Name of hospital  City  State
SECTION D		Household Serial No
Name of person(s) who filled this form:		
Date form filled, _____		

[illegible]

## PROCEDURE C QUESTIONNAIRES

- a. The household interview questionnaire.—This questionnaire was identical to the one shown for Procedure A except the questions on hospitalization (questions 15, 16, and 17 and table II) were omitted. The questions on hospitalization were asked in a self-administered questionnaire.
- b. The self-administered questionnaire.—This questionnaire was identical to the mail form in Procedure B for households not reporting hospitalizations in the interview.

### LETTER AND BROCHURE

These were mailed to households before the interview. The letter was sent to all households to be interviewed. The brochure was sent to only Procedure B households.

FORM HH-8-14-2  
(2-27-61)

U. S. DEPARTMENT OF COMMERCE  
BUREAU OF THE CENSUS  
Regional Office  
673 Federal Building  
Detroit 26, Michigan

Tel. WO 3-9330  
Ext. 216

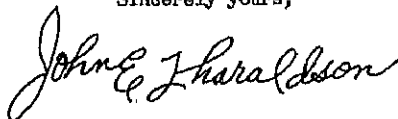
Dear Friend:

The Bureau of the Census has been asked by the Public Health Service to act as its agent to carry out a survey to obtain information about illnesses, diseases and injuries among residents of this area. The survey is one part of the National Health Survey Program which Congress recently authorized because of the need for up-to-date statistics on the health of our people. Physicians, research workers, and other groups in health fields are much interested in the knowledge which will be gained from this survey.

Every month several thousand addresses are chosen to give a cross-section of the whole United States, and the people at those addresses are interviewed to obtain the necessary information. This month the address of your dwelling place is one of those chosen, and you will be visited by a Census Bureau interviewer within the next week or two. The interviewer will ask you a number of questions about the health of the members of your family, particularly about the illness and injuries you have had in recent weeks. Your cooperation in helping complete a questionnaire will be very much appreciated.

The information you give will of course be held in confidence. We have the assurance of the Public Health Service that the information will be seen only by authorized personnel of the two agencies and that nothing will be published except statistical summaries in which no individuals can be identified.

Sincerely yours,

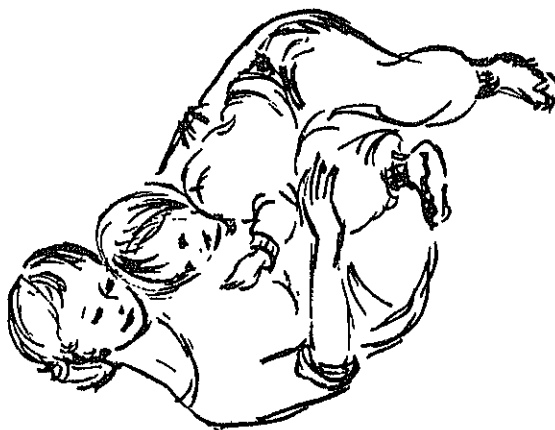


John E. Tharaldson  
Regional Field Director



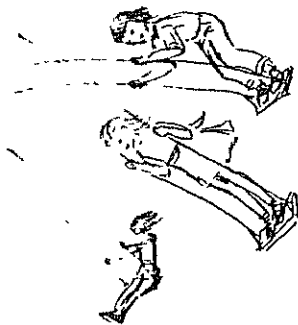
U.S. DEPARTMENT OF HEALTH, EDUCATION,  
& WELFARE  
PUBLIC HEALTH SERVICE

# THE NATIONAL HEALTH SURVEY



*"The health of its citizens is essential  
to the strength and vitality of the Nation."*

Abraham A. Ribicoff  
Secretary of Health, Education and Welfare



*"A healthy people is perhaps the nation's greatest  
resource. To protect this resource and plan for the  
future, requires accurate knowledge of the present  
state of the health of the population."*  
*"One of the most significant steps toward this goal is  
the National Health Survey."*

Dr. Luther L. Terry  
Surgeon General of the  
U. S. Public Health Service

Because your government wants to protect your  
health and the health of the nation, in 1956 the Na-  
tional Health Survey was authorized by the United  
States Congress.

The National Health Survey is conducted by the  
U. S. Public Health Service. Its purpose is to collect  
information about health conditions from a repre-  
sentative sample of the nation.

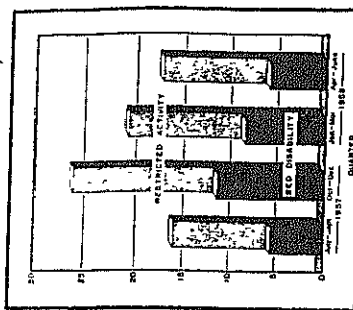
In order to collect information on health, a random  
sample of families throughout the United States is  
selected to be interviewed.

Your name and address has been selected as part  
of this sample.

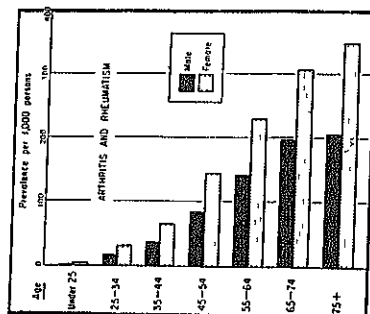
An authorized interviewer from the U. S. Bureau of the Census will call at your home within a few days. The Bureau  
of the Census collects the interviews for the National Health Survey.

We hope that you will cooperate with the interviewer in order to make this survey successful. In this way you will  
be contributing to the information needed to help protect the health of the nation.

These charts are examples taken from earlier reports of  
the National Health Survey



Number of days of illness resulting in restricted activity or bed disability



Number of cases of arthritis and rheumatism per 1000 people in the nation by their sex and age.





## SELECTED REPORTS FROM THE U. S. NATIONAL HEALTH SURVEY

Public Health Service Publication No. 781

General survey design (concepts, and definition)

Plan of the U. S. National Health Survey . 25 cents

Design of the Health Household Interview Survey . 35 cents

Functions in the Health Household Interview Survey . 30 cents

Survey results by topic

Patients Discharged From Short Stay Hospital, United States, July 1961-June 1965 . 30 cents

Capital Bill Paid By Insurer, Discharged From Short Stay Hospital, United States, July 1966-June 1966 . 40 cents

Age and Length of Stay, Short Stay Hospitals, United States, 1964-1966 . 40 cents

and Evaluation Report

1. Purpose Medical History Techniques . 30 cents

2. Health Examination Survey . 35 cents

3. Death in the Last Year of Life . 30 cents

4. Hospitalization in the Health Interview Survey . 50 cents

5. Response Compared With Medical Records . 45 cents

6. Co-operation in a Health Examination Survey . 35 cents

7. Single-Vital Cardiovascular Examination . 30 cents

8. Hospitalization Reporting in Three Survey Procedures

### Catalog Card

*U. S. National Health Survey*

Comparison of hospitalization reporting in three survey procedures: a study of alternative survey methods for collection of hospitalization data from household respondents. Washington, U. S. Department of Health, Education, and Welfare, Public Health Service, 1963.

48 p. : tables. 20 cm. (U. S. Health statistics, ser. 100)

U. S. Public Health Service. Publication no. 804-148

Conducted by the Survey Research Center of the University of Michigan under contract with the U. S. National Health Survey and in co-operation with the Bureau of the Census.

1. Health surveys: Methodology. 2. Sampling (Statistics) I. Michigan. University Survey Research Center. II. Title. III. Title: Study of alternative survey methods for collection of hospitalization data.

Cataloged by: Department of Health, Education, and Welfare Library